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1923

CHAMBERS'S COMMERCIAL HANDBOOKS

COMMERCIAL GEOGRAPHY OF THE WORLD

PART I—THE BRITISH ISLES

BY

A. J. HERBERTSON, M.A., PH.D.

PROFESSOR OF GEOGRAPHY IN THE UNIVERSITY OF OXFORD

NEW AND THOROUGHLY REVISED EDITION

BY

J. HAMILTON BIRRELL, M.A., F.R.S.G.S.

LECTURER IN GEOGRAPHY AT THE HERIOT-WATT COLLEGE;
AND FORMERLY GEOGRAPHY MASTER, BOROUGHMUIR SCHOOL, EDINBURGH

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PREFACE.

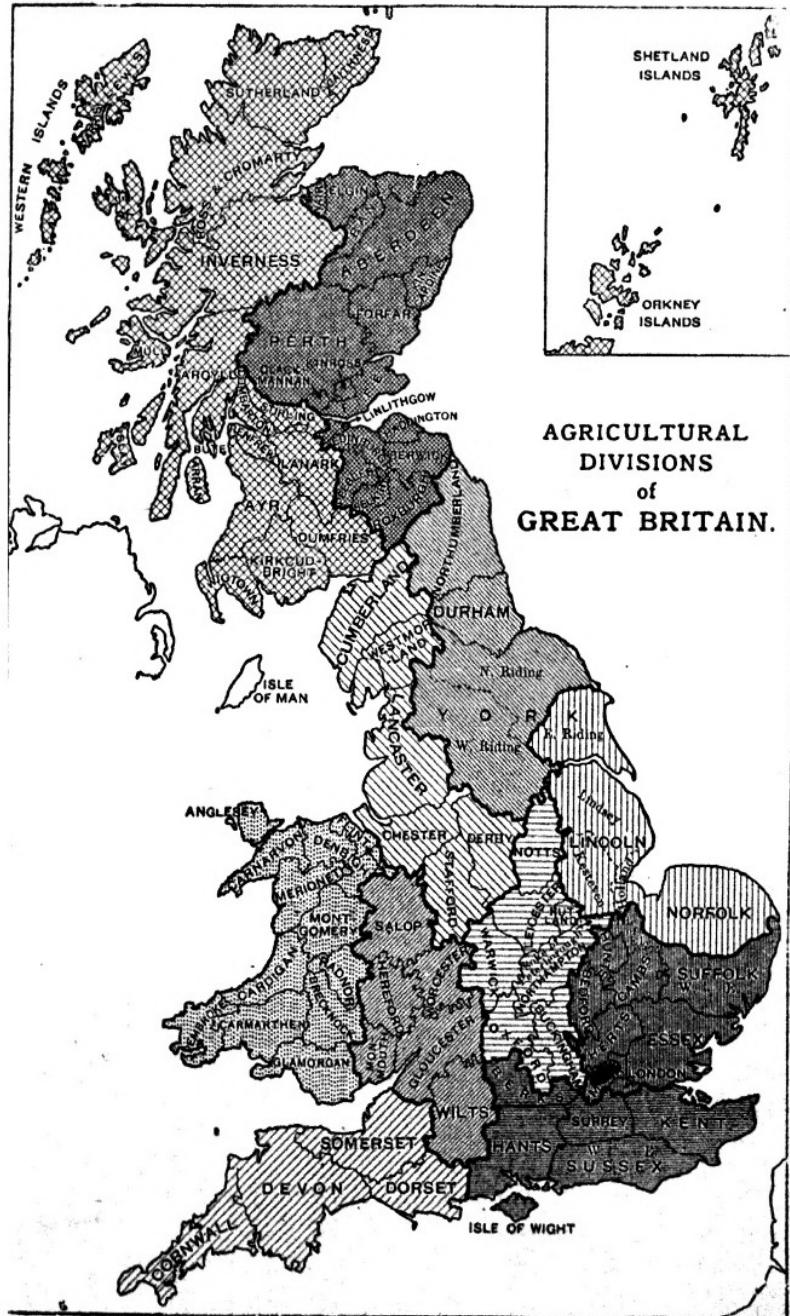
THE present book, first published in 1899, grew out of the courses of lectures on Commercial Geography given by the author in the Heriot-Watt College, Edinburgh. The chapter on trade-routes summarised a short course given in Manchester in connection with the Owens College and the Geographical Society.

The book is intended for students and teachers of Commercial Geography who begin with the Commercial Geography of the British Isles. One word of warning is perhaps necessary. The whole of the details given are not intended to be learnt by heart. Figures are frequently quoted merely for purposes of comparison, to illustrate the relative importance of different branches of production and trade.

Commercial Geography cannot be understood without a grasp of geographical principles and their economic bearings. In this connection the perusal of Dr Keltie's suggestive little book on *Applied Geography* is recommended. The study of recent trade and consular reports in the light of geographical principles is an admirable exercise. The *Statesman's Year-Book*, or some similar statistical annual, the weekly *Board of Trade Journal*, and the admirable weekly commercial newspapers, *The Times Trade and Engineering Supplement* and the *Manchester Guardian Commercial*, should be in the hands of every teacher who desires to be up to date. The *Shipping World Year-Book* is useful for information regarding ports and tariffs. Such works should constantly be placed in the hands of students, who should be encouraged in every possible way to deal with information at first hand.

In preparing this book free use has been made of the numerous articles in *Chambers's Encyclopædia*, to which teachers are referred for fuller information. Mr Chisholm's *Handbook of Commercial Geography* and *Chambers's Gazetteer* have also been used; while most of the statistics have been taken either from Government Reports or from the 1923 edition of the *Statesman's Year-Book*.

The statistics throughout the book have been brought up to date in this thoroughly revised edition.



AGRICULTURAL DIVISIONS OF GREAT BRITAIN.

DIVISIONS	AGRICULTURAL DIVISIONS AND SUBDIVISIONS.	Total Area of Land and Water.	Returned as under Woods and Plantations.	Estimated Area of Mountain and Heath Land used for Grazing.		Returned as		
				Acres.	%	Acres.	%	
I.	(a) Beds., Hunts., Cambs., Suffolk, Essex, Herts., Middlesex, London, York, E.R.	3,646,000	126,000	3·5	39,000	1·1	958,000	27·1
	(b) Norfolk, Lincoln, Berks., Hants.	3,774,000	122,000	3·2	50,000	1·3	1,026,000	27·2
II.	(a) Kent, Surrey, Sussex,	3,886,000	449,000	11·5	130,000	3·3	1,456,000	38·2
	(b) Notts, Leicester, Rutland, Northampton, Bucks., Oxford, Warwick.	3,349,000	156,000	4·7	8,000	·2	1,836,000	54·7
III.	(a) Salop, Worcester, Gloucester, Wilts, Monmouth, Hereford, Somerset, Dorset, Devon, Cornwall.	3,900,000	262,000	6·7	120,000	3·1	2,155,000	55·2
	(b) Northumberland, Durham, York, N.R., York, W.R.	5,077,000	208,000	4·1	1,098,000	21·6	2,170,000	42·7
IV.	(a) Cumberlaund, Westmorland, Lancashire, Stafford, Cheshire, Derby.	4,725,000	185,000	3·9	656,000	13·9	2,319,000	49·0
	(b) Wales (12 counties),.....	4,778,000	184,000	3·9	1,324,000	27·8	2,053,000	43·0
V.	Scotland (East)	6,546,000	453,000	6·9	2,179,000	33·3	546,000	8·3
VI.	Scotland (West)	12,915,000	416,000	3·2	6,924,000	53·6	941,000	7·8
VII.	Great Britain.....	56,300,000	2,768,000	4·7	12,843,000	22·6	17,452,000	30·7
							14,731,000	25·9

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INTRODUCTION.

ECONOMIC, or, as it is more often called, Commercial Geography, deals with the distribution of things of economic importance. It regards geography from the point of view of men's activities in getting food, shelter, and other material goods, and neglects all other aspects of the subject. The river Mersey, for instance, is of interest in Economic Geography, not because it rises in the Pennines and flows westward to the Irish Sea, but because its waters are available for turning machinery, for scouring, bleaching, and dyeing, and because its estuary forms one of the great waterways of the world. The Pennines themselves are important because of the grass on their sides, which feeds sheep, and because of the coal in their flanks, which is used as fuel in mills and houses, in the engines which convey freight between mills and markets, and in the steamers which sail from Liverpool and other neighbouring ports.

Economic geography, therefore, must take into account the geographical conditions which help man to make a living. The sea supplies fish and salt, and

is a pathway for his ships. The rivers supply water for domestic and industrial use, and, if navigable, afford an easy and cheap means of transport. The plains yield food for man and beast; the hills are pasture grounds; the very rocks yield stone for building purposes, clay for bricks, coal for fuel, iron and other metals for the necessary implements of manufacture and transport.

The occupations of men, therefore, have a natural distribution. On the coast they become fishers, sailors, or traders; on the plains, farmers; on the hills, shepherds; while mining and other industries depending upon coal and iron spring up where these sources of natural wealth are available.

Examination of a physical map of the British Isles shows that the south-east of Great Britain and the centre of Ireland are plains; the rest of Great Britain and all the west and the corners of Ireland are generally mountainous, with plains of small extent. The south-east and east of Great Britain, therefore, are mainly agricultural, and the west mainly pastoral.

Agriculture is more developed in Ireland on the central plain than in the mountains to the north-west and south, but cattle-rearing is everywhere more important than the cultivation of the soil. This is largely due to the heavy rains, an illustration of the fact that climate as well as relief helps to determine the nature and distribution of occupations.

For many centuries minerals played a comparatively unimportant part in the economics of our island, except in the extreme south-west, where tin early attracted foreign traders to Cornwall. Salt was much in demand for preserving meat for the winter, and continued to

be so until the development of transport rendered the produce of distant markets available at all seasons of the year. At the dawn of history in Britain much of the land was uncleared forest, and hunting and fishing were the chief occupations. In Roman times the country must still have been densely wooded, for we find some of the main Roman roads leading over the bare mountain-tops, which were easier to cross than the wooded land below. In the regions that had been cleared of trees agriculture developed, and corn was exported to the Continent. Forest clearing, however, is a slow process, and for many centuries the chief product was wool from the numerous sheep which fed on the grassy slopes of the unwooded uplands. With the gradual clearing of the forests, agriculture became more and more important, but sheep-rearing remained the staple industry. The wool was not, however, manufactured at home, but was exported to Flanders. More than one English monarch attempted to introduce the woollen industry, and from time to time numbers of Flemish weavers settled in this country.

As the forests were gradually cut down and timber became scarcer, coal was increasingly used for fuel, and its consumption was enormously increased by the application of steam to machinery in the eighteenth century. The demand for machinery which sprang up at that time reacted on the iron industry, and led to the diversion of much land to industrial uses. Home production of raw material no longer sufficed for the rapid development of industry.

Meanwhile, although the population increased rapidly, the proportion of those engaged in raising food diminished, and the home food-supply became

quite inadequate. Foreign trade, therefore, had a twofold object—to dispose of the surplus commodities, and to supply the deficiency of raw material and food. Hence the paramount importance of trade, home and foreign, to our country, and the taunt sometimes levelled against us that we are a 'nation of shopkeepers.'

In studying the economic geography of the British Isles, therefore, we have to consider the geographical conditions as they affect such primary occupations as fishing, the rearing of animals, or the tilling of the soil; to explain the reasons for the distribution of its industries and industrial cities; and to describe the great internal trade-routes, the great ports, and the commodities carried in the ships that enter and leave them.

CHAPTER I.

PHYSICAL CONDITIONS OF BRITAIN.

Mountains, Plains, Rivers, and Coasts.—The physical features of the British Isles are of great economic importance. The high land of Great Britain lies in the north and west; the low land occupies the south-east, and is nearest to the Continent of Europe. Ireland, farther removed from the Continent, is more or less isolated, and its east coast, which is nearest Great Britain, has few good harbours.

A line from the Exe to Whitby divides Great Britain into two parts—an older, hillier, northern and western part, and a younger, flatter, southern and

eastern part. The south-eastern plain reaches the west coast only at the Bristol Channel, and across the Cheshire plain to the Dee and the Mersey. These outlying portions of the plain separate the Cornish Heights from the Welsh Mountains, and the Welsh Mountains from the Pennine Uplands and the Mountains of Cumberland respectively. Farther north, the Central Lowlands of Scotland divide the higher ground into the Southern Uplands and the Highlands of Scotland, and permit communication from east to west. The long, narrow depression of Glenmore divides the Graipian plateau from the North-west Highlands.

Each of these regions of lower land, permitting ready communication from east to west of the island, is of great economic importance. In the case of England, the Bristol Channel serves as an outlet to the west through Bristol, Gloucester, Newport, Cardiff, and Swansea, corresponding to the estuary of the Thames, where London is the centre, on the east. Even more important is the flat Cheshire plain, which permits communication with the central plains of England. The Mersey estuary, with Liverpool and Birkenhead, on the west, corresponds to the Humber, with Grimsby, Immingham, Hull, and Goole, on the east. The Cheviot Hills and the Southern Uplands of Scotland practically shut off communication between the two seas, and narrow the route to the north along the east coast, which is flat and easily traversed south of them. The great firths of the Forth and the Tay on the east, and of the Clyde on the west, stretch far into the heart of the Lowlands, and permit products to be easily received and distributed through Glasgow,

Greenock, and other west-coast ports, and through Leith, Grangemouth, Dundee, and other east-coast ports. This is the place to cut a great ship-canal across Great Britain, which would join the Clyde and the Forth, and prove of great commercial, as well as of great strategic, importance. The narrow depression of Glenmore is relatively unimportant from an economic point of view, as it is entirely in a mountainous region, and connects no great fertile plains or busy industrial districts.

From north to south the east coast is bounded by comparatively flat land, which is interrupted only by the Southern Uplands and the Highland plateau approaching close to the sea, and by the estuaries of the Forth and the Tay, which necessitated long detours before these firths were bridged. Communication from the Thames almost to the very north of Great Britain has long been possible across the flat land along the east coast. The eastern barriers are not so formidable as those on the west coast, where communication was obstructed north of Lancashire by the Cumbrian Mountains, then by the Southern Uplands of Scotland, and lastly by the great extent of the Highlands. The lands around the Solway Firth could be reached only by the difficult route from the south between the Pennines and the Cumbrian Mountains, by the North Tyne from the east, or by the valleys of the Liddel, the Annan, and the Nith, which formed the equally difficult passes to the north. The valleys of the Tay and the Spey form passes across the centre of the Grampian Highlands. The railways now traverse these, the easiest tracks across a difficult country.

The rocky, precipitous western coasts have many drowned valleys which form excellent harbours, but the lack of productivity in the surrounding area (hinterland) makes most of these harbours comparatively unimportant, though Milford Haven forms a packet and naval station. The exceptions are where the estuaries are found in the western flat lands, and these are of the greatest importance now that the Atlantic Ocean has become a great highway for trading-ships. The chief are the Clyde, which reaches into the Lowlands of Scotland; the Mersey, which indents the Cheshire plain, across which the Weaver serves as a waterway; and the Bristol Channel, with the canalised Severn and the Warwickshire Avon communicating with the heart of England.

On the east coast, on the other hand, there are few good harbours except in the estuaries of the great tidal rivers and in the firths of eastern Scotland. The Tay and the Forth reach into the heart of the Scottish Lowlands. The Aberdeenshire Dee, the Tyne, and the Tees, though navigable only near their mouths, are outlets for important industrial regions. The Humber, the Wash, and the Thames are the most important in the south, and the chief waterways of the English plain reach the sea by them. The Humber is connected by the Yorkshire Ouse and the Trent with the flat lands of the north-east and centre of England. Parts of the Yorkshire Ouse and its tributaries, and almost the entire length of the Trent, have been rendered navigable by canalisation. The shallow Wash extends into the marshy Fenland, across which sluggish rivers like the Welland and the Great Ouse, now canalised, form waterways. The

Thames valley breaks through the line of chalk heights between the Marlborough and the Chiltern Hills, and serves as an outlet, not merely for the lowlands to the east of them, but also for those to the west. The canalising of the Thames and the Kennet has made them important waterways.

The south coast has many good harbours, such as Southampton Water and Portsmouth Harbour, but the line of chalk Downs which flanks it prevents ready communication with the interior, where the Kennet and the Thames form the natural route to the sea. The south-western harbours at Plymouth Sound and Falmouth Bay are excellent, but have little land behind them, while most of what there is is relatively unproductive upland.

Many of these physical hindrances to communication have been overcome by engineers in the last half-century, and now the railways follow not merely the lowlands that we have mentioned, but travel over the hills through passes like that of Shap in Westmorland, or tunnel through the oolitic and chalk scarps of central and southern England.

In Ireland the mountains lie, as a rule, round the coast, thus leaving a great central plain. This central plain is drained mainly by the Shannon, a navigable river expanding into great lakes, and forming a wide estuary, which, unfortunately for Ireland, opens to the west and not to the east. In the south, west, and north there are many good harbours, but they are in the more hilly regions, have relatively difficult communication with the interior, and do not face Great Britain. The southern and northern ports, however, are more favoured in this way than the

western, as the ports in the south communicate with the south-west of England and the Continent, and those in the north with the west of the Scottish Lowlands. The most important openings are Waterford and Cork Harbours in the south, and Lough Foyle in the north. The east coast has few good natural harbours, that of Belfast Lough being the best. Dublin, at the mouth of the Liffey, is on a gentle incurve of the coast, but Dublin Bay is not naturally a good harbour, and engineering works have been necessary to form the harbours at Dublin and Kingstown. Even now vessels of the largest size cannot get up to Dublin.

Climate and Vegetation.—‘All flesh is grass,’ says the Preacher, and all animals ultimately depend on plants for their subsistence. Plants alone have the power of obtaining food from the simpler elements found in the air, water, and soil. This they can do only in the light, and when there are sufficient heat and moisture. Their distribution thus depends on that of sunshine, heat, and moisture; in other words, on climate. The nature of the soil and drainage must also be taken into account, but where the climate is unfavourable good soil and drainage do not avail.

In spite of their situation in the northern part of the north hemisphere, between latitudes 50° and 60° N., the British Isles are specially favoured as regards climate. They lie to the north-west of the continent of Europe, and rise above the waters in the north-east of the Atlantic Ocean. Land near a great ocean has a more equable climate than that remote from the sea, and if the prevalent winds blow from the warmer parts of the ocean, as in the case of the British Isles, such a

country has an exceptionally equable and mild climate. Our land is therefore better suited to the growth of plants than most other lands in similar latitudes. The prevalent winds come from between south and west at all seasons of the year, and blow over stretches of warm Atlantic water. When they reach our shores they are heavily laden with moisture, most of which is visible in the form of clouds. The western mountains deflect the winds upwards, leading to cooling and condensation of the water vapour. This causes heavy rains along the western coast and the west of the higher lands. On the other side of the mountains the air begins to descend again, becoming warmer and drier as it sinks once more to the sea-level. On the whole, therefore, the mountainous parts, more particularly their western slopes, are cloudy and rainy; the plains, more particularly in the east, are clear and dry. This has a very important effect on the nature of the plants grown, which in the west are species thriving best in dull, rainy conditions, and in the east those which require a relatively dry, clear climate.

In dull, wet regions plants run to leaf; their fruits mature more readily under drier and sunnier conditions.

From an economic point of view, the fundamental difference between west and east is that in the west those economic plants flourish whose leaves are of most use (and of these grasses are by far the most important), and in the east cereals and fruits ripen well. The grass-lands of the country are found in the west and in the uplands, the grain and fruit regions in the plains, more particularly on the eastern side of the mountains.

Temperature, however, as well as humidity, must

be taken into account. For every additional 300 feet in altitude the temperature falls on an average 1° F.; for every additional degree of latitude it falls a little more than 0·5° F.; so that in the higher lands and in the north the conditions are less favourable for plant growth than in the plains and in the south. The temperature of winter is less important than that of summer, for grains and fruits require warm, sunny weather to ripen them, while many seeds and trees can withstand hard frosts. Moreover, many seeds are not sown until the winter is over.

The winter temperature of the British Isles varies little from north to south, but diminishes from west to east. Hence grass grows at all times of the year in the lower parts of the western section of the country, whereas in the east and in the higher lands the cold winters interrupt its growth.

The east is warmer in summer than the west, because it is less influenced by the cooling action of the sea, and the temperature is higher in the south than in the north; so that in summer the south-east is the warmest and the north-west is the coolest part of the British Isles. The dry, warm lands of the south-east are those that favour the ripening of the cereals. Above a certain height the summers are too cold for this to take place, even where the rainfall is suitable. Hence the highest parts of the British Isles are either bare or covered with poor grass, heather, or bracken; or, in the western parts, where the water accumulates in the hollows, great peat-bogs or mosses occur. In Scotland more than three-quarters of the land is unproductive, but in the south of Great Britain and in Ireland the proportion of waste land is less than a quarter. Thirty-

three per cent. of the United Kingdom is covered with permanent grass, and 26 per cent. grows cereals and other crops, including grasses under rotation.

Soils.—Soils are formed of decomposed rocks. They may be divided into clays, sands, and loams. Clays consist of very fine particles that are easily pressed together, and so do not let water pass through them easily. Sands are very different; their particles are larger and looser, and water easily percolates through them. Loam is a mixture of clay and sand in almost equal parts, and may contain more or less organic matter. The organic matter in soils is known as humus, and is of very great importance, its presence making soils fertile.

Lime is found in most soils in greater or smaller quantities, and is very useful when not too abundant. A very limy soil may contain as much as 20 per cent. A clay with a fairly large proportion of lime is called marl.

Soils depend in the first place on the nature of the rocks from which they are decomposed. Soils formed from immediately underlying rocks in the place where they are found are by no means the commonest in the British Isles. They occur mainly south of the Thames, where chalk and flints enter so largely into their composition that they are not very fertile. Many of the limy soils, like those of the Downs and the chalk and oolitic scarps, produce excellent grasses, which form food for many sheep.

Most of the soils of the British Isles are mixed, as the greater part of the archipelago has been covered by glacial drift. The ice, passing over many kinds of rocks, has ground up the waste of these together

to form boulder clay. There is a very noticeable difference in the fertility of the soils north and south of the Thames, the former being one of the richest agricultural soils in the British Isles, because of the mixing brought about by the ice in a region where very many different kinds of rock are found close together. The open clays which form good wheat-land are mixed soils.

Rivers, passing, as they do, through many different kinds of rock, bring down rock-waste of different composition and a large amount of vegetable débris. This makes the river alluvium, which is a very fertile soil, and much of the Fenland and the valleys of the Yorkshire Ouse and the lower Trent is formed of it. Alluvium occurs in the flood plains, and borders the estuaries of all great rivers.

There is considerable difference in the fertility of the soils derived from the older rocks. Many of the volcanic soils are fertile, but the hard crystalline rocks of the highland plateaus yield a comparatively poor soil. On the other hand, the Old Red Sandstone and many Carboniferous rocks yield fertile soils, but the limestone which covers so much of Ireland is not a specially favourable one for agriculture.

CHAPTER II

THE BIOLOGICAL CONDITIONS OF BRITAIN.

Grass-lands.—Where the elevation is over 1000 feet or the rainfall more than 40 inches a year, the land is almost entirely covered with grass, unless

special conditions of temperature or soil make it waste land. This grass-land includes all the mountain area of the western parts of the British Isles. In these districts, as a rule, the grass forms permanent pasture and is little broken up for cultivation, although here and there a patch of ground is sown with oats, and in Ireland considerable areas are planted with potatoes. In the other parts of the islands grass is found either as meadow-land or coming in rotation with other crops. Much of the cultivated grass is used for hay, but the proportion of this is less in Scotland, where the summer is cooler and more rainy than in other parts of the kingdom.

In Ireland 45 per cent. of the land is covered with permanent pasture, whereas in Great Britain the proportion of permanent pasture is 30 per cent. (Scotland, 7·3 per cent.; Wales, 40 per cent.; England, 40 per cent.).

Cultivated Lands.—The drier and lower lands in the east, more particularly of Great Britain, are cultivated. In Ireland 20 per cent. of the land is arable, in Scotland 16 per cent., in Wales 15 per cent., and in England nearly 33 per cent.

Of this land the greater part is cultivated with a rotation of crops—cereals, roots, and grasses—of which cereals are the most important, except in Ireland and Scotland, where only 36 per cent. of the arable land produces cereals, compared with 44 per cent. in Wales and 50 per cent. in England. The principal cereal crop in the British Isles is oats. Two-fifths of the cereal-land of Great Britain and five-sixths of that of Ireland is sown with this grain. The oat flourishes in the cold, moist summer of the northern and western

parts of the kingdom, and the limit of its successful cultivation is fixed by the limit of early autumn frosts, which in the far north, or at a considerable height above the sea-level, kill the plant before the grain has matured. Only in England is less than half the cereal-land covered with oats.

Wheat is the most important English cereal, about one-fifth of the arable land being sown with it. One-quarter of the land producing cereals in Great Britain is sown with wheat, but only two-fifteenths in Wales, one-twentieth in Scotland, and one-thirtieth in Ireland. Wheat requires a warm, dry summer, and the climate of the plain of eastern England and its rich soil are specially suited for raising heavy crops. Much of the wheat grown here is winter wheat—that is, wheat sown in autumn; and although this is one of the colder regions of the British Isles in winter, the wheat-plant is hardy enough to stand the winter temperature. Wheat-growing on an extensive scale is restricted to this part of England, not because the other parts of the kingdom are colder in winter, but because they are cooler, wetter, and more cloudy in summer.

Barley, the most widely distributed of all grains grown by man, requires less sun than wheat, and many varieties have the advantage of ripening a week or two sooner after sowing than the oat, so that they can be reaped before the autumn frosts appear. Rather less than a fourth of the land producing cereals in Great Britain, and about an eighth of that in Ireland, is sown with barley. The wheat-growing area of England is also the region where most barley is produced. The barley of this region is exceptionally well suited for

brewing, and is cultivated for industrial rather than food purposes.

Little rye is cultivated in the British Isles, and that mainly as a green food, though some is allowed to ripen for its valuable straw.

Great changes have taken place in the last half-century in the cereal-producing areas of the British Isles, and in the nature of the crops sown. In Great Britain the cereal-land was reduced by one-tenth in twenty years, and in Ireland by one-fourth. Formerly half the cereal-land in England was sown with wheat and only one-fifth with oats, whereas now two-sevenths are wheat and three-sevenths oats. In Great Britain over 40 per cent. of the cereal-land used to be wheat-land and 30 per cent. oat-land; now the figures are reversed. The proportion of barley has remained almost constant. In Ireland only 2½ per cent., instead of over 10 per cent., is wheat-land. The area of cultivated and permanent grass has grown correspondingly, having increased by over 50 per cent. in Great Britain in twenty years. This is largely owing to the cheapness with which cereals can be imported from all parts of the world by the numerous quick steamer services which have grown so rapidly in the past half-century.

After cereals the green or root crops are the most important cultivated plants of the British Isles. The potato, introduced from America, and the turnip, grown as a field-crop since the end of the seventeenth century, are important food-stuffs. Potatoes, turnips, and mangolds are sown on an area about 16 per cent. of the arable lands in England, 12 per cent. in Wales, 12 per cent. in Scotland, and 20 per cent. in Ireland.

Potatoes flourish in the moister west, and are by far the most important crop grown in the west of Ireland. Sixty per cent. of the land producing root and green crops yields potatoes in Ireland, but only 18 per cent. in Great Britain. In the west of Great Britain the proportion of potatoes to cereals is also greater than in the east. East Lothian and Fife, in Scotland, however, are both noted for potatoes which are largely in demand in restaurants owing to the skins not breaking on reheating.

Turnips are of special importance in the sheep and cattle rearing regions, where the animals are fed on them in winter. They are abundantly cultivated in all counties of England outside the corn area. Over 10 per cent. of such counties as Norfolk, East Riding of Yorkshire, Berwickshire, and East Lothian is sown with turnips every year. The production of the mangold is chiefly carried on in England, and the area is gradually increasing.

Of the industrial plants, flax and hops are the most important. Flax is grown extensively only in Ulster; about 4 per cent. of the arable land of this province is sown with it. The western counties of Donegal, Fermanagh, and Cavan produce much less than the eastern ones. A little is sown in one or two Scottish counties.

The production of hops is practically confined to the counties in the south of England—Kent, Surrey, Sussex, Hants—along with Hereford and Worcester.

The cultivation of fruits on a considerable scale is confined to the south-east of England and the Severn Valley, but many small orchards and fruit-farms exist in favoured localities throughout the British Islands, especially in the east.

Market-gardens abound round the large cities, more particularly near London, and in the Channel and Scilly Islands.

Woods.—Over 5 per cent. of England, 4·5 per cent. of Scotland, 4 per cent. of Wales, and 1½ per cent. of Ireland is covered with forests. In England, Kent, Surrey, Sussex, Hants, and Monmouth are the only counties with more than 10 per cent. of their surface wooded; and in Scotland, Kincardine, Aberdeen, Moray (Elgin), and Nairn are the regions with the densest plantations—all these counties except Aberdeen having more than 10 per cent. of their surface wooded. It will be seen that the densest woods exist in the driest hill regions of the islands.

Deciduous trees, such as the oak, beech, elm, ash, alder, and maple, are commonest in the plains and fertile lands. In the northern and higher regions these give place to pine-trees. Many mixed woods of deciduous and coniferous trees exist, especially in the valleys of the mountainous regions.

Useful Animals.*—**Cattle.**—The distribution of animals is largely determined by the distribution of grass-lands. The rich meadow grass of Ireland and the western part of England is especially suitable for cattle. The proportion of cattle in Ireland is twenty-five to the hundred acres, and in England and Wales about fifteen, while in Scotland it is only six. In England and Wales cattle are most numerous in the counties of Cheshire, Leicester, Pembroke, Cornwall, Lancashire, Somerset, and Staffordshire. In all

* Much of the information in this section is obtained from Dr Fream's admirable *Elements of Agriculture* (11th ed.; London, 1920).

the counties named there are over twenty cattle to the hundred acres. In Scotland, in no county are cattle so numerous. The majority are found in western counties like Renfrew and Wigtown, where the grass is rich and the winter mild, or in West Lothian, Fife, and Aberdeen, where they are fattened for the market. Galway is the only Irish county with less than fifteen cattle per hundred acres; while the counties of Limerick, Meath, and Dublin have over thirty cattle per hundred acres.

There are over a dozen native breeds of cattle in the British Isles. Of these by far the most important is the Shorthorn, which, originating in the Tees district of Durham at the end of the eighteenth century, has spread all over the country, and is also widely distributed abroad. It is a breed noted for its beef and milk, and easily adapts itself to different climatic conditions.

Dairy cattle are found principally on the low lands, where rich meadow grass is obtainable. The Short-horn (three-fourths of the total), the Longhorn of the Midlands of England, the Red or East Anglian polled cows, those of South Devon and of Kerry in Ireland, are among the chief breeds; but, above all, the cows of Ayrshire, in Scotland, and of Jersey, Guernsey, and Alderney, are famous as milk producers.

The large cattle which are reared for their beef belong to the Shorthorn breed, found in all parts, or to the Hereford, Sussex, Welsh, Galloway, or Aberdeen breeds, whose distribution is indicated by their names.

Some breeds, such as the Shorthorn, the East Anglian, the South Devon, the Welsh, and the Dexter Kerry, are reared both for meat and for milk.

The Highland cattle are a small but very hardy

breed, living on the poor pasture of the Scottish mountains, and, like the larger Galloways, yielding good beef.

Many of the cattle reared for the butcher are stall-fed, and feeding-stuffs of many kinds, some imported, are used.

Cows that are used for dairying have to be treated differently from cattle fattened for the market. To produce milk rich in fats, which are necessary both for butter and cheese making, a richer diet is essential, as cows that feed on poor pasture yield milk which is small in quantity and poor in quality. Dairy cows require much more careful attention than cattle reared for the butcher.

Sheep.—Broadly speaking, sheep are found chiefly in regions where cattle are few. They are commoner in the drier east than in the rainier west. They are found on the hillsides rather than on the plains. The chalk Downs of England and the Southern Uplands of Scotland are the best sheep-regions ; but large numbers feed on the steep and easily-drained hillsides of the west, where they are reared principally for their mutton, whereas those on the eastern heights are bred largely for their wool as well as for their flesh. In England over thirty, in Wales sixty-eight, in Scotland thirty-five, and in Ireland fifteen sheep are found to the hundred acres. There are more sheep per hundred acres in Roxburgh, Selkirk, and Berwick than anywhere else in the kingdom. In Kent both Romney Marsh and the Downs are suitable for sheep-rearing, and one sheep is found to every acre. In all the counties through which the Downs extend the proportion of sheep is considerable. Cumberland, Westmor-

land, the limestone height counties, and most of the Welsh counties except Pembroke and Carmarthen have more than fifty sheep to the hundred acres. In Scotland all the southern counties, as well as the south-west of the Highlands, are noted for their sheep. In Ireland, Connaught and Leinster have more sheep than either Ulster or Munster; Carlow, Wicklow, and Galway being the counties which have over forty sheep per hundred acres.

The mountain sheep, such as the Black-face and the Cheviot sheep of Scotland and the Welsh mountain sheep, are usually horned, and as a rule have rough fleeces, with thick, strong wool. They yield mutton of very fine quality. Except these, together with the Border Leicesters of the south of Scotland and the Roscommon breed of Ireland, all the other varieties of sheep are English. Of these, the most important are the long-woollen Cotswolds, Leicesters, and Lincolns, and the short-woollen sheep of the Downs and Shropshire. The pure Leicester is largely used for crossing with other sheep, especially those fattened for the market. The Southdown sheep, with fine short wool, has been used for crossing with, and thus improving the breed of many short-woollen sheep, some of which now form distinct varieties, like the Oxford Downs.

There are many varieties of sheep confined to limited regions, such as those of Romney Marsh, the Exmoor sheep, the Wensleydale, the Limestone breed of Westmorland, and others.

Horses are largely found in the drier parts of the British Isles, on less hilly ground than the sheep. In England, the three Ridings of Yorkshire, Norfolk, Cambridge, and Huntingdon have more than five

horses per hundred acres; and in Ireland, Down, Wexford, and Louth have the same number, and Dublin has double. In Scotland most horses are reared in Fife and Linlithgow; but the proportion is only about three per hundred acres.

There are two types of horses—the heavy work-horses, of which the Shire, the Clydesdale, and the Suffolk are the different breeds; and light horses, such as the thoroughbred, the hackney, the Yorkshire carriage-horse, and the small ponies which are found in the less accessible, less fertile, and more rugged parts of the island, such as the Shetland Islands, the Highlands of Scotland, the Welsh mountains, Dartmoor and Exmoor, and the New Forest. The Yorkshire coach-horse is bred in the north-eastern counties, more particularly in the North and East Ridings of Yorkshire itself. The hunter and thoroughbred are reared in different parts of England and in Ireland. The hackney or nag is reared chiefly in the eastern counties, more particularly in Norfolk, Cambridge, Huntingdon, Lincoln, and Yorkshire. The Shire is the largest work-horse, and is reared mainly in and around the Fenlands. The slightly smaller and more graceful Clydesdale is bred in the region which gives it its name. The Suffolk horse is still smaller in size, but is long-lived and a good worker.

Pigs.—The proportion of pigs to cattle is greatest in the south-east of Ireland and England; but the largest number per acre is found in such eastern counties as Suffolk, Essex, Middlesex, Bedford, Cambridge, Huntingdon, and such western ones as Flint, Cheshire, Anglesey, Somerset, Dorset, and Cornwall. The total number in England is over seven, and in

Wales under five, per hundred acres. In Scotland, most pigs are reared in Clackmannan, Wigtown, and Midlothian; but they are comparatively few. On the other hand, in Ireland most counties rear more than six pigs per hundred acres; the proportion being least in Connaught and greatest in Wexford.

Most pigs in Britain are white in colour, and are distinguished as Large, Middle, or Small White breeds. There are two black breeds, known as the Small Black of Suffolk and Essex and the Berkshire breed; while the Tamworth sow, originating in Staffordshire, is red.

The Large White sows yield a great proportion of lean meat and can be grown to enormous weights, whereas the Small White sow usually makes very fat bacon.

The British Farmer and his Competitors.—In spite of the large quantities of farm produce of every kind grown in the British Isles, the supply is wholly inadequate to the consumption of the country, and cereals, vegetables, meat, and dairy produce of all kinds are imported in ever-growing quantities. While the yield of English wheat crops per acre is higher than that of any other country in the world, except that of the small wheat-producing area of Scotland, the British farmer has found it difficult to compete with the settler who has cultivated the virgin lands of temperate North and South America, or with the native of the Punjab. He labours under the disadvantage of cultivating a soil which requires heavy manuring and careful tillage to produce good crops, while the high rent paid for land and the cost of fertilisers and transport by rail more than counterbalance the advantages due to the proximity of his markets. Rent and freight

charges will undoubtedly be reduced; but even then the British farmer may find it more profitable to turn his fields into pasture lands than to compete against imported grains. Agriculture involves great scientific knowledge as well as practical skill; and in the matter of agricultural education our country has been comparatively backward compared with the United States, Denmark, and some of our colonies. With a more careful and intensive use of the natural agents of the country, the quantity and quality of pastoral and agricultural products may be still further improved; and in the future intensive agriculture with co-operative marketing will probably become much more important.

Fisheries.—Fishing is a great source of food-supply. In this country fresh-water fish are comparatively unimportant. The salmon and sea-trout, which migrate between salt and fresh water, are caught in the rivers, mainly in the estuaries of Scotland, western England, and Ireland, more particularly in the Spey, Tay, Tweed, Severn, Bann, and Shannon.

The sea fisheries are exceedingly valuable. The turbot, sole, flounder, and other flat fish; the cod, haddock, herring, mackerel, and pilchard, are the most important fish caught. The waters over the shallow banks of the North Sea, and round the islands in the north and west of Britain, are visited by fishermen from many ports. From every little fishing village men fish with hand-lines, catch shellfish in traps, and go out in fishing-boats or motor boats to the adjacent fishing-ground, where both lines and nets are used. The great cities are supplied with fish from the fishing-ports, which send out fleets of sailing and steam trawlers and other fishing-vessels, some of which have

tanks where fish can be kept alive until the ship returns to port. The fish may be sent from the fishing-grounds in swift carrier vessels direct to London, or to the nearest port, whence they are despatched by special fast trains to the great markets. The east coast fisheries are the most valuable, and three-quarters of the fish are landed in England at east coast ports.

Fish are caught by hooks or in nets, which are either fixed or hauled. Short lines are used close to the shore all round the coast. The east and south coast fishermen send out very long lines (some even eight miles in length, in eastern England), to which hundreds of baited hooks are attached. These are sunk across the current to let the short lines, to which the hooks are attached, float clear of the long one. When hauled in, haddock (in Scotland), cod (in the east of England), cod, ling, conger, skate (in the south of England), and many other predaceous fish are caught. The Scottish fishermen use mussels for bait, those in southern England squids or cuttlefish.

Where the bottom is smooth a trawl is used. It consists of a netted bag, with finer meshes near its end, the mouth of which is fixed to a beam raised a little above the bottom. This is hauled along, and brings up flat-fish such as flounders, soles, plaice, halibut, turbot, and others, together with fish that feed at the bottom of the sea, like cod, haddock, hake, and ling. The trawls are usually carried by steamers, but sometimes by sailing-vessels. From Aberdeen, Leith, and Granton, trawlers go eastwards to the banks in the North Sea, or northwards as far as Icelandic waters. In eastern England, Hull, Grimsby, Yarmouth, Lowestoft, and Ramsgate send

trawlers to the Dogger Bank in winter and to the east of the North Sea in summer, whence the fish are sent to these ports or to London by fast steamers. On the south coast, Brixham and Plymouth are the chief trawling stations, the boats going as far in summer as the north coasts of Cornwall, where east coast boats also come. In the Irish Sea, steam-trawlers leave the Lancashire ports of Liverpool and Fleetwood. Sailing-trawlers fish from Morecambe, Fleetwood, Southport, and the Mersey estuary; a few are sent from Whitehaven. Line-fishing and herring-drifting are carried on off the Isle of Man.

Migratory fish, such as the herring, mackerel, and pilchard, are caught in nets. Drift-nets are sunk across a current, and the heads of the fish are entangled in the meshes, which vary in size according to that of the fish to be caught. The herring is much the most important. It is caught chiefly off the Scottish coast in the west early in the year; in the north in summer; farther and farther south, along the east coast of Britain, as the year advances; and in the English Channel in winter. The ports of the Clyde sea-area, Strome Ferry, Stornoway, Lerwick, Wick, Fraserburgh, Peterhead, Aberdeen, and the Forth ports are the chief Scottish centres of the herring-fishing; and the north-east of England ports, especially Grimsby, and Yarmouth farther south, are the chief English centres. Off the south coasts of England and Ireland mackerel-fishing is very important. Pilchard-fishing is confined to the south-west of England. The pilchards are caught in nets, which are let down across a bay such as that of St Ives in Cornwall, and hauled to land by ropes. Sometimes so many fish are trapped

that a number of smaller nets have to be used inside the barrier formed by the big one, which would break with the pressure of the fish were it drawn ashore.

Many 'shellfish,' such as lobsters, crabs, shrimps, and other crustaceans, are caught in traps or netted, and oysters and other molluscs are dredged.

About 32,000 men are engaged in fishing in Scotland, 40,000 in England, and 15,000 in Ireland ; but the value of the English is three and a half times that of the Scottish fisheries, and twenty-five times that of the Irish, mainly owing to the nearness of large markets. In Scotland about ten men, and in Ireland about five men, in every thousand are fishermen. In England and Wales the proportion is one man per thousand.

CHAPTER III.

DISTRIBUTION OF MINERALS AND MINING CENTRES.

THE mineral wealth of the British Isles is mainly in the older rocks of the west and north. In the newer rocks of the south-east, clay (for making bricks), lime, and chalk are the most important mineral products.

The older rocks yield valuable minerals, and most of the sandstones and limestones can be used for building purposes.

Building Materials.—Of the building stones, the most important are the sandstones of Carboniferous and Permian times ; but the oolitic limestones are also used for building purposes. The granite rocks of Aberdeenshire, Galloway, and Galway are quarried for stones

suitable for massive structures, such as bridges and reservoirs, where great strength is required, and for ornamental stones to be used in public buildings. Marble is quarried in Ireland.

Carboniferous limestones, as well as those of more recent date, are burned to yield lime, which is used as mortar or as a purifier or a fertiliser. Portland stone is ground to form an exceptionally quick-setting mortar known by the name of Portland cement.

In many parts of the older regions of the British Isles local stone is used for building purposes, whereas in the south-east of Great Britain nearly all the houses are built of brick. The hard old red sandstones of Caithness can be cut into large, flat, thin slabs which form excellent pavement.

Slates for roofing purposes are formed of rocks which are easily split into thin layers. These are usually clays which have been subjected to great heat and pressure. Purple slates are found in Wales, more particularly round Llanberis and Festiniog. The green slates of Tilberthwaite in Cumberland are the most beautiful of all; and different blue, gray, and purple slates are found in various parts of Scotland, more particularly in Perthshire and Argyllshire (at Easdale and Ballachulish), and in Ireland (in Cork and Tipperary).

Some Carboniferous rocks are useful for making fireclay, more particularly those of 'The Potteries' in North Staffordshire, those round Kilmarnock in Ayrshire, and those in Tyrone. Fine pottery is made in 'The Potteries' and in Worcester, whither kaolin or china-clay, a decomposed granite suitable for making the finest porcelain, is taken from the Cornish peninsula.

Coal.—Coal is the chief mineral mined in the British Isles. Iron and coal are two of the great sources of our industrial prosperity. ‘The rich underground kingdom of the English and Scottish coalfields has often been called the Black Indies.’ As coal is used in reducing the ores of the useful metals, especially iron, we shall study its distribution first.

Coal is found in the Carboniferous rocks, and therefore in the west and centre of Great Britain. The coal has been preserved in the rocks which form the trough of the Scottish Lowlands. In England the coal-measures covered the whole of the Pennine heights; but, though they are still found on both flanks, they have been worn away from the summits. They are also found where the Carboniferous rocks bend down on the eastern and south-eastern sides of the Welsh Highlands. In Ireland, which was formerly entirely covered by coal-measures, only a few isolated patches of coal now remain.

Coal-mining is carried on in Ireland at Castlecomer in Kilkenny, and at Dungannon in Tyrone, but is not important. The chief fields in Great Britain are the Scottish coalfield, divided into the western or Ayrshire coalfield, the central coalfield in Lanark, Linlithgow, and Stirling, with an outlier in Clackmannan north of the Forth, and the smaller fields of Fife and Midlothian; the Northumberland and Durham to the north-east, the Cumberland to the north-west, the Yorkshire, Derbyshire, and Nottinghamshire to the south-east, the South Lancashire and the North Staffordshire to the south-west, of the Pennines; the North Wales, the Shropshire and Worcestershire, the Forest of Dean, and the South Wales coalfields on the borders of the

Welsh mountains; the Midland in South Staffordshire, Warwickshire, and the borders of Leicestershire and Derbyshire, and the Bristol, both surrounded by young rocks. Coal is also mined in East Kent.

(Those in black type are the most important.)

Coal is usually mined; but in a few places it is simply quarried. Its value has long been known. There is evidence that it was quarried even in Roman times. Sea-coal was sent to London from Newcastle from the thirteenth century onwards. With the growing scarcity of timber, the use of charcoal for iron-smelting became too expensive, and in the eighteenth century coal came into general use for this purpose. This gave a great impetus to the extraction of coal. New mines were opened and carried deeper and deeper to meet the ever-increasing demand due to the application of steam-power to machinery. The output steadily increased till 1913, when over 287,000,000 tons were raised, but declined during the Great War. In 1922 the output was 250,000,000 tons. Of this total the Yorkshire, Derbyshire, and Nottinghamshire field yielded 70,000,000 tons. The Northumberland and Durham field put out 48,000,000 tons. The South Wales coalfield, including Monmouthshire, produced over 50,000,000 tons, the Scottish coalfields 35,500,000 tons, the Lancashire coalfield about 18,000,000 tons, the two Staffordshire coalfields 12,000,000 tons, and the others put together 16,500,000 tons.

The quality varies considerably in the different coal-fields. In most it is a soft black coal, producing considerable heat and smoke. The cannel coal of central Scotland was formerly almost exclusively used for making gas, but it is now almost exhausted. Anthra-

cite from the South Wales coalfield is exported to large cities like Paris, where it is burned in stoves. Welsh steam-coal supplies the smokeless fuel for our navy.

The coal yielded in the various coalfields is put to very different uses.

In Scotland it is used in the iron and textile manufactories, more particularly in the west, as well as in Fife and southern Scotland. Much is exported from the Forth to the North and the Baltic Seas, to the Mediterranean, and even farther; from the west,



Scottish Coalfields.

chiefly to Belfast and the North of Ireland. The latter region also receives the surplus coal from the Cumberland coalfield, some of whose output, however, is used in smelting iron ores in Furness.

The output of the Northumberland and Durham coalfield is largely used in the iron industry. The surplus is exported, large quantities being shipped to London and all over the world.

The York, Derby, and Nottingham coalfield supplies the woollen factories of the West Riding of Yorkshire, the ironworks of Sheffield, and the textile

works of Nottingham. Any surplus is sent to London by rail, or from Goole or Immingham on the Humber.

The coal of the South Lancashire coalfield is almost entirely used in the local cotton manufactories and



English Coalfields.

engineering and chemical works. It also supplies fuel for steamers sailing from Manchester and Liverpool. Hardly any is available for export.

The North Staffordshire coalfield supplies steam-power in the pottery district.

The Midland coalfield supplies fuel for the Black Country in South Staffordshire, the great centre of the iron manufacture. Large quantities are sent by rail to London.*

The North Wales coal is used locally and in the salt and chemical works of Cheshire.

The Shropshire-Worcestershire coalfield, stretching between Coalbrookdale and Bewdley, supplies the ironworking region of South Staffordshire to the east, the Worcester potteries to the south, and the woollen manufactures at Kidderminster.

The Forest of Dean coalfield provides the coal needed in the local iron smelting and forging.

The Bristol coalfield supplies that city and the West of England woollen manufacturing centres.

South Wales coal is shipped to all parts of the world. Some is used in the district for smelting different ores. Many of these are imported, copper and iron ores being brought from Spain, and tin ore from the Malay Peninsula, as it is less difficult to carry the ores to the coal than the coal to the ores.

* 'Of the coal-basins in Great Britain, the Midland coalfields are the least favourably placed for foreign trade. The Scottish basin is encircled and penetrated by the sea. The estuary of the Clyde on one side and the Firth of Forth on the other open it up by their long fjords, and form, as it were, large natural canals. The Durham and Northumberland coalfield stretches in the direction of a coast-line with numerous and excellent ports, among which it will be sufficient to mention Newcastle and Sunderland. The Welsh coalfield is provided for by the long estuary of the Bristol Channel. In the presence of three rivals so well equipped for exportation, the Midland coalfields are quite naturally designed to carry on the home trade.'—Quoted, with slight modification, from *The Labour Question in Britain*, by Paul de Rousiers. Translated by F. L. D. Herbertson. Page 165. London, 1896.

Anthracite is sent to the great brewing centres, steam coal, which is almost smokeless, to vessels in the British navy, and to all our naval coaling-stations.

Iron.—Iron is by far the most important of the metals obtained in the British Isles. It is found in several forms. In the more recent rocks, pouches of iron exist here and there, and used to be worked before the discovery of the richer deposits in the older rocks. They occurred mainly in the chalk rocks, and the timber of the wooded Weald was used for smelting them. The finest British iron ore is the red hematite of Cumberland and North Lancashire, which is an oxide of iron easily reduced to the pure metal. The brown hematite, not quite so rich in iron, is mined in South Wales, the Forest of Dean, Northamptonshire, and Antrim. Blackband and clayband iron ores, impure carbonates of iron, are found in most of our coalfields, as, for instance, in the Scottish Lowlands. The fact that iron and coal so frequently occur together has had much to do with the rapid development of the manufacture of iron in the British Isles. Another great advantage is that lime, which is used as a flux in smelting, is generally also present in the same region, together with a plentiful supply of fireclay.

Middlesbrough has become the most important iron-smelting centre in Britain since the discovery of a suitable method of obtaining iron from the ironclays, which form much of the Cleveland Hills in north-east Yorkshire. It obtains coal from the Durham and Northumberland field, and limestone is found comparatively near. Magnetic or black iron ore, the finest of all, is imported from Sweden to the ports of Durham and Northumberland, to be smelted mainly

at Middlesbrough, Stockton, Darlington, and the Tyne ports. The Scottish Lowlands are important iron centres. The local iron ores are supplemented by red hematite from Spain. Glasgow, Airdrie, Coatbridge, Motherwell and Wishaw (now one town), Hamilton, and Falkirk are the chief centres. Barrow smelts the red hematite of the Furness region, with coal brought from Cumberland, Scotland, or Northumberland. South Wales receives most of the great imports of Spanish iron ores, through Swansea, Cardiff, and Newport, and the smelting is carried on at Newport, Merthyr Tydfil, and other centres. The iron ore of the Midlands is smelted in and around Birmingham, at Wolverhampton, Dudley, Walsall, Wednesbury, and other places, mainly in South Staffordshire. Iron-smelting is important in the West Riding of Yorkshire, especially at Rotherham.

Other Metals.—Traces of the precious metals are found in many parts of the United Kingdom, but rarely in quantities sufficient to pay working expenses.

The Cornish peninsula has long been one of the chief European sources of tin. Copper is also found, but the ore is now almost exhausted. Zinc is mined along with lead in the North of Wales and in Northumberland. Lead, in the form of silver-lead ore, from which both metals are extracted, is also found in the Lead Hills in Scotland, in Cumberland, Northumberland, Wales, the Isle of Man, and the Wicklow Mountains in Ireland.

Peat.—In Ireland, northern Scotland, and other regions where great peat-bogs exist and coalfields are distant, peat is cut and dried for fuel. In Ireland it is even used industrially; and this use of peat will

largely develop with the discovery of a suitable process for turning it into coke.

Oil-shale.—In the midlands of Scotland, more especially in Midlothian, West Lothian, and Fife, large quantities of oil-shale are mined. This oil-shale is a compressed black clay, from which burning and lubricating oils can be distilled and candles and other paraffin products extracted. Sulphate of ammonia, a by-product, has become a valuable fertiliser.

Salt.—One of the most useful minerals is salt. On many parts of the coast it is obtained by evaporating sea-water, but great beds of rock-salt exist in the valley of the Weaver in Cheshire (near Northwich), at Droitwich in Worcestershire, and in south-east Durham. From these beds salt is obtained either by mining or by pumping the brine, but principally by the latter process. In addition to its domestic utility, salt is used in Worcester to form a glaze for pottery, and in Cheshire, South Lancashire, and in the north-east of England in various chemical industries.

CHAPTER IV.

DISTRIBUTION OF MANUFACTURES AND MANUFACTURING CENTRES.

Rise of Manufactures.—The manufactures of the British Isles, now so important a branch of national activity, developed but slowly until last century. They grew out of the domestic industries necessary in an early stage of society, when every household was more or less self-supporting. Then, doubtless, every housewife spun wool or flax into yarn, wove the yarn into

cloth, and made the cloth into clothes and napery, while the men provided shelter, weapons, and implements.

One of the first trades to become important was that of the smith. Our Teutonic forefathers deified Thor the Hammerer. Confined in early times to the forging of armour, weapons, and implements, the smith's trade has now become increasingly complex with the extended use of iron in the arts of peace and war, until at the present day engineering is one of our most important occupations.

In the same way the other domestic industries of primitive society have developed into highly-skilled industries carried on by specially-trained workmen. Spinning or weaving now forms the only occupation of thousands of people. The grinding of grain into meal, the baking of flour, and the fermenting of grain have similarly become special trades practised by great bodies of men. The tanning of hides and the making of leather goods are now also special occupations. With the opening up of the country the trades connected with transport of various kinds grew up, developing later into the great railway industries. The ancient Briton made his small canoe in the roughest way; the modern Briton constructs great ships which sail to the uttermost parts of the earth.

Classification.—Manufactures can be classified in several ways, as, for instance, those dealing with the production of food, those having reference to shelter or protection, and those concerned with transport. Another possible classification is according to the nature of the raw material—mineral, vegetable, or animal; still another according to the process of manu-

facture—mechanical, chemical, or biological. For instance, the making of cloth is a mechanical process, the making of dyes a chemical one, and brewing a biological one. No hard-and-fast line, however, can be drawn, for the manufacturer of cloth often dyes it, and the brewer has chemical as well as biological processes to consider. The problem of the manufacturer—to transform some natural product into an artificial one, which will be of greater use than the unworked raw material—is on the whole a simpler one than the brewer's, which is to transform organic materials into their most utilisable form. Here we shall deal first with the mechanical industries connected with clothing, shelter, and protection, such as the textile and iron industries, and then with the chemical and biological ones.

The Textile Industries.

Historical.—The textile or spinning and weaving industries have grown very gradually. Several unsuccessful attempts were made by English kings to introduce them as special industries before the efforts of Edward III., in the fourteenth century, led to the settlement of weavers in East Anglia and elsewhere. The chief centre was round Norwich, more particularly in the village of Worstead, which has given its name to worsted goods. Numerous other manufacturing centres existed over the chalk Downs. The populous and prosperous south-east of England was the chief industrial region until the discovery of coal led to a shifting of the woollen centres.

Woollen and linen manufactures had grown up both in Lancashire and Yorkshire; but these were far

removed from the more densely populated regions. Manchester cottons, probably a mixture of wool and linen, are mentioned in old works. At the end of the fifteenth century the Yorkshire woollen manufacture was stimulated by the settlement of Flemish weavers. With the application of coal to industry, those manufacturing centres which were favourably situated for obtaining wool and coal, and were well supplied with water for scouring and dyeing, grew at the expense of the others. The once great woollen manufacture of Norwich declined because neither coal nor water-power was available.

Sources of Power.—During the past century steam was the chief source of power used in industry. To-day the use of electricity is becoming more and more common, steam being used to generate it. In regions with adequate supplies of water-power ('white coal') electricity is steadily displacing coal. As the century advances more use may be made of tidal and solar powers. Another valuable source of energy is oil ('yellow coal'), which may be used economically for driving machines on both land and sea. This may lead to a considerable rearrangement of the industrial centres, which would tend to develop in regions with abundant water-power—that is, in the mountainous parts of the country—and more particularly near the coast, where water transport is available for obtaining raw material and distributing manufactured goods. Electrical energy may be transmitted many miles to industrial areas.

The Manufacture of Woollens.—Before the arts of spinning and weaving were discovered, men probably pounded the wool fibres together into a felt. Before

wool is manufactured at the present day it is first of all cleaned and scoured in pure soft water, such as that of the streams of the Southern Uplands of Scotland, where there is no limestone. A little alkali is added to the water to remove the natural grease in the wool. The wool is next teased to separate the fibres, and oiled to keep them from snapping in the course of carding and spinning. Carding is the process of separating each fibre of the wool, after which a number are condensed together and then spun or twisted round and round into yarn. The yarn is next woven into cloth. A series of parallel threads of yarn is fixed to form a warp, and another thread is made to cross this warp at right angles (under alternate threads), forming the weft of the cloth. The cloth is then scoured to clean and soften it, and milled or felted to make it more compact. The old way of felting or fulling was to soap the cloth, and then beat it with big hammers; but it is now milled in a machine. The felting property, which is peculiar to wool and hair, makes woollen cloth denser and more compact than that made from vegetable fibres. Dyeing may be done at any stage of manufacture, most commonly after the wool is scoured or the yarn spun; but for some purposes the material is not dyed until after the cloth is woven.

Woollen Manufacturing Centres.—Although considerable quantities of British-grown wool are exported to other woollen manufacturing centres on the Continent, the home supply of wool does not suffice for the woollen manufactories. Sheep's wool is brought from Australia (especially fine merino wool), New Zealand, South Africa, and other countries; and manufacturing

centres near good ports have an advantage over others, especially if they are also near a good coal and water supply. At the present time the woollen manufacture is carried on in three chief centres—in Yorkshire, the west of England, and the Tweed valley.

The **Yorkshire** woollen district is exceptionally favourably situated as regards the easy supply of raw material and the distribution of the manufactured articles. It lies between the Irish and the North Seas, with the great ports of the Mersey on the west and the Humber on the east. The hills of Yorkshire afford pasture for thousands of sheep, its coalfield is of almost inexhaustible richness, and it is excellently watered. Leeds, on the Aire, is the great market for the West Riding

industrial towns and villages. Bradford, in the same valley, is the centre of worsted factories. Halifax, Huddersfield, Dewsbury, and Wakefield, in the Calder valley, specialise in some branch of the industry.

The **West of England** woollen district has also its port, Bristol; the coalfields of Bristol and the Forest of Dean are near; and numerous streams drain the Cotswolds. Stroud in Gloucestershire, and Bradford in Wiltshire, are the most important centres.

The **South of Scotland** woollen district has some of these advantages—uplands for pasture, mountain rills and streams, but less accessible coalfields. Hawick,



Woollen District.

Galashiels, Selkirk, Innerleithen, and Jedburgh on the Tweed and its tributaries, Dumfries on the Nith, and Langholm on the Esk are the chief manufacturing towns. They manufacture hosiery and tweeds (the latter so named from confusion with the word 'twills').

Rochdale in Lancashire, but near the Yorkshire border, combines woollen and cotton manufactures. Some woollen manufacture is carried on on a small scale in many towns both in Great Britain and Ireland, more particularly where wool is plentiful. Flannels are made in the upper valley of the Severn at Welshpool and Newtown, which are near the West Shropshire coalfield. Witney in Oxfordshire is noted for blankets. Kiddernminster and Wilton make carpets. Leicester hosiery has long been famous. Hand-loom weaving has not quite disappeared, and the strongest cloth made in the British Isles is probably the Harris tweed, manufactured in this way in the Outer Hebrides.

The Manufacture of Linens.—Linen thread and cloth are made from the fibres of the flax-plant. This plant, once widely cultivated for domestic manufactures, is now grown almost exclusively in Northern Ireland. The plants are uprooted, and the fibres separated from each other by allowing the stem to rot or partially rot—that is, ferment—either in soft water or simply on wet grass. They are next dried, and then broken, which permits the removal of the woody parts. This process is called 'scutching.' The fibres are combed or 'heckled,' and the long fibres, or 'line,' separated from the short fibres, or 'tow,' and the line is prepared for spinning, the next process it undergoes. Successful spinning requires a certain humidity of the air, and the finer linen threads are spun when quite wet. The linen yarn is finally woven into cloth.

Linen Manufacturing Centres.—Historically the manufacture of linen is next in importance to that of

wool; flax, like wool, being a home product. In the time of Charles I., Wentworth introduced the cultivation of flax into the north-east of Ireland, which is the principal seat of the production of lint and linen at the present day. Although Northern Ireland has no coal, except at Dungannon, it is situated opposite the Ayrshire and Cumberland coalfields, whence cheap supplies can be procured. The water of Ulster is very suitable for bleaching linen, which is the chief manufacture of Ireland. Belfast is by far the most important centre, making all kinds of linen goods, but especially the finer sorts. Lisburn, Lurgan, and other towns of Northern Ireland manufacture lawn, cambric, and fine linen. Outside Ireland linen is spun and woven principally in Fife, where Dunfermline, the chief centre, is noted for its table-linen. At Kirkcaldy coarser linens are made; and in Forfarshire—at Dundee, Arbroath, and Brechin—still coarser goods, such as canvas and sailcloth, are woven. Fife possesses several special advantages. Flax is imported from the Baltic, which lies opposite to Fife; and coal is obtained from the Fife and Clackmannan coalfields. The constancy of the temperature and of the humidity of the air are favourable climatic conditions. Barnsley, the only important centre in England, lies in Yorkshire, east of the Pennines, and, like Kirkcaldy, makes upholstery linen.

The Manufacture of Cotton.—Raw cotton consists of the fibrous hairs surrounding the seeds of the cotton-plant, which belongs to the mallow and hollyhock family. It flourishes in tropical and subtropical lands, but the latter (U.S.A. and Egypt) yield almost 90 per cent. of our imports. The fine white hairs are

separated from the cotton seeds by a machine called the gin. The seeds, like those of the flax-plant, yield oil and form a food-stuff for animals, while the stalks are made into paper. The 'cotton-wool' is carded, drawn, and spun into yarn, and then woven into cloth. Little more than a century ago cotton yarn could not be spun strong enough to make the warp, for which linen or wool was used. Nowadays both warp and weft are of cotton, and this pure cotton cloth is called calico. Cotton is also used mixed with linen, with wool, with silk, and other fibres to make different varieties of yarns and cloth.

Cotton Manufacturing Centres.—All raw cotton is imported. Consequently the regions near the great ports have greater facilities for obtaining it than those far inland; and, as most of it comes from the U.S.A., the west coast ports are more favourably situated than those on the east. Liverpool, Manchester, and Glasgow, three great ports of communication with America, serve the cotton manufacturing regions of Lancashire and Scotland. In both areas coal is abundant. The climate and water of these two districts are specially favourable for the cotton manufacture, which requires a fairly damp atmosphere for successful spinning and weaving. A great development of the cotton manufacture has occurred in the past century. Formerly cotton was mixed with other fibres; but since the introduction of steam-driven machinery the manufacture of pure cotton goods has developed until it is now the most important industry of the country. A century ago the cotton manufactured was worth little more than one-twentieth that of the wool; but at the present day it is worth double, while the value

of the linen manufactured is only one-fifth that of the cotton. By far the greatest proportion is manufactured in South Lancashire, in the towns surrounding Manchester, such as Stockport (which, however, is in Cheshire), Ashton, and Stalybridge;* Oldham, Rochdale, Bury, and Bolton; and in the towns on the north of the Lancashire coalfield, Burnley, Accrington, Blackburn, and Preston. Manchester manufactures little, but is the great market and distributing centre.



Cotton District.

In Scotland cotton is manufactured—chiefly into cotton thread—at Paisley.

Most machine-made lace is composed of cotton threads, for the linen threads of which the beautiful, delicate hand-made lace is formed are too fine for machinery to manipulate. Nottingham is the chief centre of cotton-lace and net manufacture.

Cotton, Woollen, and Linen Manufactures.—‘A century ago the value of cotton, woollen, and linen yarns and piece goods produced in Great Britain and Ireland was about £22,000,000—say,

* Stalybridge is partly in Lancashire, but principally in Cheshire.

woollen, £17,000,000 ; linen, £4,000,000 ; and cotton, £1,000,000. Of recent years the value has been about £200,000,000—say, cotton, £120,000,000 ; woollen, £55,000,000 ; and linen, £25,000,000. The total amount of capital employed is about £250,000,000 ; and at least 5,000,000 people—men, women, and children—are dependent upon these textile industries for their livelihood. Moreover, one-half of the value of British and Irish products exported consists of textiles.*

Jute and Hemp Manufactures.—Jute is a plant of the lime-tree order, which flourishes in hot, moist climates, in regions with rich soil, such as the Ganges delta. It grows five, ten, and even more feet high, and the fibre is separated by rotting, like linen from the flax-stems. The manufacture of yarn and cloth is carried on very much like that of linen, but all the fibres are carded. Jute is a long, strong, silky fibre, and the finer tissues assume a silky appearance. Unfortunately it is difficult to dye in fast colours. Jute carpets, curtains, handkerchiefs, and fabrics may be made ; but the staple jute product is coarse sacking for bags. The manufacture of jute is almost entirely confined to Forfarshire (Scotland), where Dundee, Arbroath, and Forfar are important centres.

In these towns hemp is also spun, and rope-making is carried on all round the coast, as every seaport requires it. Hemp is grown in most European and many other countries ; but our largest supply comes from the Baltic, our finest from Italy. Sisal hemp, originally from Yucatan, and Manila hemp are strong fibres derived from quite different plants.

Silk Manufacture.—Silk, like wool, is a fibre of animal origin. It is secreted as a fine thread by the caterpillar or larva developed from the egg of a moth.

* Thomas Ellison in the *Statesman's Year-Book*.

This silk thread forms a cocoon, within which the larva passes a quiescent stage of its life; then it dissolves part of the silk cocoon, and emerges as a moth again. The silk-rearer heats the finished cocoon, and thus kills the larva. He then softens with hot water the gum binding the silk threads, and unwinds and reels up, by hand or machine, several fine fibres together as one thread, known as raw silk. This is cleaned and twisted into thread and woven but sometimes the raw silk itself is used for the warp. Spitalfields, in London, was long famous for silk-weaving; but few looms are now employed there. The manufacture of silk is scattered up and down the country, the chief centres being Macclesfield, Derby, Coventry, and Leek (threads for needlework), while silk waste is manufactured in Bradford. The raw silk is all imported. Artificial silk is prepared from cellulose.

Fibres for Textile Manufactures.—The fibres used in our textile industries are few in number. Flax, cotton, jute, and hemp are of vegetable origin; wool and silk of animal origin. Vegetable fibres, like the ramie or China grass, have been tried. China grass is an exceptionally strong and beautiful fibre, but hitherto the difficulties of preparing it for spinning have prevented its general adoption for cloth-making. Several hundred fibres at least exist which might be used for textile purposes; and it is desirable that systematic experiments should be made to test the value of each of these, samples of which are to be found in the great collection at Kew Gardens.

The Iron Industries.

In the past century iron, and in recent years steel, a specially prepared form of iron, have largely replaced wood as a constructive material. Iron beams and pillars are used as supports in building; iron or steel

is the most common material for bridges; rails are laid with it, and it enters largely into the construction of trucks and of carriages; the locomotives that draw the trains are made of it, and we traverse our roads on steel vehicles. Machinery of all kinds is mainly constructed of steel; our ships are almost entirely built with that metal, and the guns and projectiles of our navy and army are principally composed of iron in some form or other. Less striking, but equally important, is its use in bolts, screws, and rivets, for purposes too numerous to mention.

South Staffordshire has long been a famous centre of the iron manufacture, for the timber of its forests was used for smelting the local iron ore long before its coal was utilised. All kinds of metallic goods are turned out here, from the proverbial pin at Birmingham to the anchor at Tipton. Nail and chain making are carried on at Cradley Heath; locks are made at Walsall and Wolverhampton; keys at Wednesbury; and tin-plate, gun-barrels, armour-plate, great girders, and railway plant of all kinds are turned out in the numerous factories of the busy district of which Birmingham is the chief city. This region is distinguished for articles involving the application of skilled labour to small quantities of raw material.

On the Yorkshire-Nottinghamshire coalfield the iron industries are centred round Sheffield. The **Sheffield district** is famous for cutlery and tools of every kind, and, in addition, every sort of steel work is made—armour plates, engine castings, shot, rails, and machinery of all kinds. Both coal and iron are found in the neighbourhood; but for the finer steels the black iron ores from Sweden are imported. Rock is also found

near Sheffield which makes exceptionally fine grindstones, suitable for use in the making of cutlery. Here, as in the Birmingham district, electroplating is an important trade. Rotherham is also an important centre for iron and brass goods.

Textile Machinery to supply the woollen manufacture of the West Riding of Yorkshire is made at Keighley and Leeds. The machinery used in the cotton manufacture is made on the Lancashire coalfield at Oldham, Rochdale, Bury, and Manchester. Here engineering works turning out materials for railways and buildings are numerous.

On the **Northumberland-Durham** coalfield railway plant construction, shipbuilding, and gun-making are the chief metallic industries. This region is the most important in England for shipbuilding, which is carried on at Middlesbrough on the Tees, Sunderland on the Wear, and at the Tyne ports, North and South Shields and Newcastle. On the Tyne is the famous ordnance factory at Elswick.

Shipbuilding is also carried on at Barrow-in-Furness, and at Belfast, which imports both iron and coal.

All kinds of metallic work are carried on on the Scottish coalfield, but more particularly in and around Glasgow. The shipbuilding on the Clyde, at Greenock, Port-Glasgow, Dumbarton, Clydebank, and Glasgow, is still the most important in the world. The engineering works of Glasgow turn out railway plant of all kinds, including locomotives, machinery, and every sort of iron goods.

Recent Developments.—In recent years considerable changes have taken place in the metal industries. The tinplate industry, which flourishes in South Wales,

declined with its growth in the United States, but has gained new markets and recovered again. The export of iron has become relatively less important. In most of its markets the United Kingdom has to compete with the manufactures of other nations, more particularly with those of the United States, Germany, and Belgium. The chemical discoveries which made the Cleveland iron ores important also made the similar ores in German and French Lorraine available for smelting, and rendered Germany a formidable rival. But the activity in shipbuilding, naval and mercantile, the making of armour plates and ordnance, the general introduction of electric lighting, power, and road and railway traction, in addition to the boom in textile and other trades in the first half of the second decade of the century, all contributed to the growth of our iron industry.

The widespread use of the cycle, motor-cycle, and motor-car in recent years has led in Coventry to the substitution of such industries for silk-ribbon weaving, which had for some years been declining, and to their development in most of the other iron centres, particularly in Birmingham and Wolverhampton. Sewing-machines are made near Glasgow. In these centres, too, aeroplane construction is advancing rapidly with the commercial use of this form of transport.

The Chemical Industries.

It is difficult to overestimate the importance of chemical industries in the modern industrial world. The case of the Cleveland iron ores has been mentioned above. In addition to improved processes of metal-working, many by-products of various

manufactures, which were formerly considered waste, have been utilised as raw materials by the application of proper chemical methods. Coal-tar, a by-product in the manufacture of gas, has been applied to many uses, and, among others, is made to yield an important series of aniline dyes. Dye substances were formerly of vegetable origin, like madder and indigo; animal, like cochineal; or pulverised minerals, like hematite. Now aniline dyes are mainly employed.

Aluminium is more and more used, and is obtained from bauxite. Electricity generated by water-power is used in the works which have sprung up at the Falls of Foyers and at Kinlochleven, near the Pass of Glencoe.

Salt, mined in Cheshire and Durham, is used in the chemical-works of South Lancashire and the Tyne, and as the basis of alkalies for bleaching and other purposes.

Sulphuric acid, used in many industries, is manufactured in the centres just named and around Glasgow.

Glass-making from silica (pure sand, quartz, flint), mixed with salt, soda, lime, potash, and lead, is the principal industry of St Helens in South Lancashire, and is important at Newcastle. (For potteries, see pp. 36 and 44.)

Soap is made by heating fatty substances with soda to form hard soaps, or with potash to form soft soaps. Tallow and vegetable oils—olive, palm, coco-nut, and cotton-seed oils—are used. As the latter are all imported, soap-making naturally flourishes in a seaport such as Liverpool or Glasgow. Glycerine is a by-product of soap-making.

The manufacture of candles, paraffin, &c. from oil-shale is carried on mainly in Mid and West Lothian.

Paper is made by bleaching vegetable fibres, usually wood fibre or esparto grass, combined with cotton or linen rags. These are reduced to a fine pulp, which is rolled and dried into a continuous web of paper. In Midlothian, round Edinburgh, and in Kent and London, where most printing is done, are many printing-paper factories; but many mills exist in other parts of the country.

Tanning is a process for preserving the hides of all kinds of animals and transforming them into leather. Most of the domestic animals supply the skins, which are treated with some solution containing tannin, such as can be obtained from oak, wattle, and other bark, acorns (*valonia*), cutch, gambier, &c., or compounds of chromium.

Industries connected with Food and Drink.

Preserved Foods.—In olden times food for winter was preserved by drying, smoking, and salting. At the present day, when transport facilities provide a continual supply of fresh food, this is no longer so necessary; but fish and bacon are still salted and smoked to preserve them and to improve their flavour. At the fishing centres, more particularly those distant from market, drying, salting, and smoking fish is an important occupation. Herring, haddock, and cod are the chief fish preserved. Finnan (Findon) haddocks in Scotland, and Yarmouth bloaters in England, are important articles of trade.

A little home meat is preserved in tins for use at sea; but the great bulk of our tinned food is imported.

Small fruits are made into jams and jellies in London and the neighbourhood, and on fruit-farms

in other parts of the country. Orange marmalade is made in Dundee and elsewhere.

Sugar is refined at Greenock, and made into sweet-meats in all large cities. It is combined with cacao (commonly called cocoa) to make chocolate in Bristol, York, Bournville (near Birmingham), and other places.

Dairy Produce, such as butter and cheese, is made in Ayrshire, Cheshire, the Midlands, Gloucestershire, and the south-western counties of England, and in Ireland.

Brewing and Distilling.—The juice of apples and pears is fermented to form cider and perry in the south-west of England, especially in Hereford and Devon; but by far the most important drinks manufactured in the British Isles are beer and whisky, both derived from barley.

Beer is made by allowing the barley grains to germinate, when the starch of the grain is changed to sugar, and the grain is called malt. The sweetened liquid extracted from the malt is fermented by the yeast-plant, and flavoured with hops. Beer is chiefly brewed in the three capitals, London, Edinburgh, and Dublin, and at Burton-on-Trent, which is near the hop-fields of Worcestershire, and possesses a large and suitable water-supply. The anthracite of Wales can be easily transported to Burton, which has a world-wide celebrity for its beer. Brewing is also carried on in all our large cities. Stout, a beer impregnated with burnt sugar, is mainly brewed in London, Burton, and Dublin.

In Scotland and Ireland the malted liquor is distilled to form whisky, which is manufactured in all the large cities. In Ireland and the Highlands of Scotland a special flavour is imparted to the whisky by the smoke of burning peat.

CHAPTER V.

TRADE ROUTES AND CENTRES.

Towns and Trade.—In Roman times almost all the towns were fortified places. Many of them can be identified by their names—Chester, Worcester, Winchester, Cirencester, &c.—which are derived from *castra*, the Latin word for camp. Even at that date, however, and, indeed, from the earliest days of human habitation in our islands, certain spots, such as fords, or the junction of two valleys or rivers, presented special advantages for meeting-places, more especially between those who had commodities to exchange. As population and trade increased most of these naturally grew into towns of greater or less importance. At a later date abbeys and monasteries attracted a considerable population, composed of members of religious houses, their pupils and servants, those who resorted to them for healing and other benefits, and the artisans, craftsmen, and traders required in a growing community. Our towns, therefore, have grown up in various ways. Some, like Warwick or Chester, developed out of fortified places; others, like Oxford, out of monasteries; others again out of such centres of local trade and traffic as fords, bridges, or *porta*. Many of these, such as Wallingford, Cambridge, Newport, Exmouth, can be recognised by their names. A group of ancient market centres, Chipping, Chipping Norton, Chippenham, Chepstow, and others, were places where *chapmen* or merchants met to sell or barter

their wares. These owed their importance to the fact that shopkeeping was little developed in the early Middle Ages, and that trade was chiefly carried on at such markets and at periodical fairs, held once a year or oftener, and lasting for days or weeks, like Stourbridge Fair, near Cambridge, which was known throughout Western Europe, and flourished in full vigour up to the middle of the eighteenth century.

In addition to the many towns well fitted to be busy centres of local trade, a few have always possessed special natural advantages marking them out for commercial greatness. Of such we have an excellent example in London, standing at the head of the tidal waters of the Thames. Here a ford existed in early times, replaced later by a bridge. Combining facilities for sea and land communication, and serving as an outlet for the rich south-east of England, London early became the chief commercial town of England, and replaced Winchester as the political capital. Bristol, on the Severn estuary, possessed a very similar situation; but, commanding a less rich district, and being comparatively remote from the Continent, it never became a serious rival of London.

The modern development of manufactures and railways has led to a corresponding development of towns. The application of motor-power to production has made the coalfields industrial centres, while its application to transport has facilitated the rise of many inland towns, especially of those at the intersection of different routes. Other things being equal, however, proximity to the sea must ever be an advantage; and the rapid growth of our foreign trade, combined with that of our manufactures, has had the most

marked effect on the prosperity of our ports and of the manufacturing towns near them. At the present day two opposite tendencies are at work. One is shown by the disposition of industry to move to the sea. This is illustrated by the removal of many important engineering firms from inland to coast towns. The second is shown by the construction of the Manchester Ship-Canal, which has secured most of the advantages of a maritime situation, with its concomitants of cheap and convenient water-transport, to an inland centre.

Internal Transport.—Internal trade is carried on by road, railway, and canal, and by coasting-vessels. The country is covered by a network of railways and canals, which is closest around the great centres, London, Birmingham, Manchester, Leeds, Liverpool, Newcastle, Edinburgh, Glasgow, Dublin, and Belfast.

Roads.—Roads are seldom employed for long-distance traffic, except where there are no other means of transport. Their chief use is to distribute goods brought by rail, canal, or sea to the nearest station or port. Carts of various kinds are generally employed for this purpose. The improvement in motors has given rise to a new traction traffic, and raised new road problems.

Canals.—The plains of England readily lend themselves to the construction of canals, which cross them in every direction. Most of our canals were made between 1770 and 1830. Few new ones and few improvements have been made since railways were constructed. The utility of many is impaired by their being both too shallow and too narrow to permit barges of fair length, breadth, and depth to pass, and few facilities for loading and unloading are provided. Yet on the plains they should give cheap transportation.

The Severn is navigable for boats of 250 tons to Worcester, the Thames for boats of 120 tons to Oxford, the Trent for boats of 200 tons to Gainsborough. It has been proposed to make the Severn navigable to Stourport for 600-ton boats, and the Trent to Nottingham for 200-ton boats. The latter is one of the most important proposals, owing to new coalfields in the Trent basin.

Birmingham is the centre of one of the busiest canal systems. Only narrow boats carrying about 30 tons are used, and those mainly for local traffic. At present canals join Birmingham to the Severn and Stour. From this and from Birmingham the Shropshire Union and the Trent and Mersey Canals connect with the Mersey. The latter also links the Birmingham system with the Trent and the Humber. From Birmingham to the Thames there are two routes—(1) by Warwick and Banbury to Oxford, and (2) by Warwick, Wolverton, and Watford to Brentford. From the latter canals run (1) to Coventry and the Ashby coalfields, (2) to Leicester and by the Soar to the Trent, (3) to Northampton and the Nen. From Brentford to Leicester is the Grand Junction Canal.

It has been proposed to improve the canals from Birmingham to the four estuaries by a system of canals capable of passing barges of 100 tons. This has been termed the Cross system.

The Thames and Severn are joined (1) by the Kennet and Avon, and (2) the Stroudwater Canal; but neither is much used.

A large number of narrow canals for drainage as well as for navigation cross the Fens.

The Weaver Navigation and the Aire and Calder Canal have adopted modern improvements in their waterways, and are successful. The coal traffic on the Aire and Calder to Goole is remarkable. The South Yorkshire Canal is partly a modern canal of considerable capacity.

Three canals cross the Pennines. Two of these unite the Irwell at Manchester to the Calder; the southern one passing through Huddersfield, the northern one by Rochdale. Still farther north, the Leeds and Liverpool Canal passes through Blackburn, Burnley, and Skipton, and a branch joins Preston to Blackburn.

The Forth and Clyde are connected by canal from Grangemouth to Glasgow, with a connection to Edinburgh by the Union Canal. In Ireland the Grand and the Royal Canals join the Liffey to the Shannon. The former joins the Shannon between

Lough Ree and Lough Derg, and has a branch to the Barrow. The Ulster Canal runs along the Blackwater to Lough Neagh, whence it connects with the sea by the Bann and by another canal with the Lagan. The deep Newry Canal, three miles long, joins Newry to Carlingford Lough.

Ship-Canals.—There are several ship-canals which are of importance in connection with the coasting and foreign trade. Some of these are natural waterways artificially deepened. All the chief rivers are constantly dredged to allow the largest vessels to enter the docks of the great ports, and thus the Thames, the Tyne, the Bristol Avon, and the Clyde may be regarded as great ship-canals. A ship-canal joins Gloucester to the navigable part of the Severn. The Manchester Ship-Canal, from the Mersey to Manchester, is wholly artificial. A ship-canal from Leeds to the Humber has been proposed. (See also p. 14.)

The Manchester Ship-Canal is thirty-five and a half miles long, and unites the Mersey estuary at Eastham with Manchester, *via* Runcorn and Latchford, by a waterway twenty-eight feet deep and one hundred and twenty feet wide at the bottom. The first twenty-one miles to Latchford are without locks. Between Latchford and the docks at Salford and Manchester, where there are over six miles of quays, four locks raise vessels sixty feet.

In Scotland the Crinan Canal saves a long voyage round the Mull of Kintyre to vessels going from Glasgow to the north-west; and the Caledonian Canal, through Glenmore, allows vessels of moderate draught to avoid the stormy voyage across the Pentland Firth.

Railways.—On the plains railways and motors compete with canals for the transport of commodities, while in the more mountainous districts they are practically the only means of carrying on trade.

London, the capital as well as the chief port and

market, is naturally the centre of the railway system of Great Britain. From this centre important lines radiate in all directions, like the spokes of a great wheel. The terminal points are either ports or great industrial towns, which, in their turn, are the centres of minor systems of radiating lines, connecting them with each other. The country is thus covered with a network of lines too complex to describe in detail, by which every town of any size is connected with the Metropolis, ports, and industrial centres, frequently by several alternative routes. This network is most closely interwoven on the plains, while in the mountainous districts all the great valleys form railway routes, except in the outlying and thinly peopled districts of Wales and Scotland, which are of little commercial importance. The effect of this keen competition is to facilitate transport and to reduce rates.

In 1850 there were less than seven thousand miles of railways in the United Kingdom. During the next twenty years the mileage was more than doubled. At the end of 1922 the total length of railways was nearly twenty-four thousand miles, of which sixteen thousand miles were in England and Wales, over three thousand eight hundred miles in Scotland, and rather less in Ireland.

From a commercial point of view a detailed knowledge of the great main lines is of less importance than a clear understanding of the facilities of transport between the various industrial towns and districts and the ports or other centres from which they obtain raw materials, or to which they distribute finished products. For convenience of reference, however, the customary grouping by main lines—a system based rather on

passenger than commercial traffic—is followed ; but it should be remembered that this simpler classification tends to disguise the complexity of the railway systems from a commercial point of view.

British Railways.—In the period which followed the Great War, when the railways were state-controlled, it was evident that for the ‘more efficient and economical working of the railway system of Great Britain,’ a new policy was necessary. Several schemes to amalgamate various companies into groups were proposed, and in the end a Railway Act was passed to come into operation on 1st July 1923, providing for four great railway groups to control the lines of Great Britain. These groups are (1) the London and North Eastern Railway (L. & N.E.R.), controlling 6590 miles of line ; (2) the London, Midland and Scottish Railway (L.M.S.R.), with 7790 miles ; (3) the Great Western Railway (G.W.R.), with 3800 miles ; and (4) the Southern Railway (S.R.), with 2200 miles. Each group was formed by the amalgamation of the more important companies in its area, and the absorption of the smaller companies.

By this scheme Great Britain is divided into four railway divisions: (a) Eastern Britain ; (b) Central England to the Scottish Highlands ; (c) the Thames basin and Wales ; (d) Southern England. It will be noted, however, that the lines of one group frequently run into the area served primarily by another group. The lines of all radiate from London.

(1.) The London and North Eastern Railway (L. & N.E.R.) which serves to link eastern Britain to the east coast ports—the busiest harbours of our island—includes the larger systems that formerly

ENGLAND

Principal Railways.



The old names are retained on the map to assist identification.

carried the trade of this part—the Great Eastern (G.E.R.), the Great Northern (G.N.R.), the Great Central (G.C.R.), the North Eastern (N.E.R.), the North British (N.B.R.), the Great North of Scotland (G.N.S.R.), and the West Highland (W.H.R.)—along with twenty-six subsidiary companies.

The L. & N.E.R. thus serves the flat lands of East Anglia, part of Central England, and links London with Berwick-on-Tweed and Scotland. Two main lines radiate from London (Liverpool Street) into East Anglia. The eastern or coastal line passes through Colchester, Manningtree (branch line to Harwich), Ipswich (branch to Norwich), Beccles (branch to Lowestoft), to Yarmouth. The second line traverses the western portion of East Anglia, utilising the valley of the Great Ouse on its route through Cambridge and Ely (branch through Lynn to Hunstanton, and another to Norwich), then north-west over the central plain to March (branch to Peterborough), Lincoln, and Doncaster.

From London (King's Cross) the East Coast Route to Scotland traverses the English Plain, by Peterborough, Grantham, and Retford, to Doncaster, beyond which it enters the Vale of York, sending branches to the West Riding woollen towns and running through York to reach the coastal plain at Darlington. Thence it runs across the Durham plain to Newcastle, serving, along with its many branches, this important industrial section of north-east England. From Newcastle a line runs by the Tyne gap to Carlisle, whence Edinburgh may be reached through Tweeddale by Hawick, Melrose, and Galashiels—the Waverley route. The main line from Newcastle runs

to Berwick, beyond which it enters Scotland, and reaches Edinburgh *via* Dunbar. From Edinburgh the railway crosses the Forth Bridge, Fife, and the Tay Bridge to Dundee and Montrose. Beyond Montrose the L. & N.E.R. has running powers over the L.M.S.R. to Aberdeen, from which the Don valley gives access to the Moray Firth by several lines which formed the old Great North of Scotland Railway.

From Edinburgh another line is carried west to Glasgow, whence the West Highlands are traversed *via* Loch Long, Loch Lomond, and the bleak Moor of Rannoch, to Fort William and Mallaig (steamer to Stornoway). Thus the L. & N.E.R. touches the west coast of Scotland at three points.

Another line (formerly the G.C.R.) runs north from London (Marylebone), crossing the Chiltern Hills at Aylesbury, and the Midland Plain *via* Rugby, Leicester, and Nottingham to Sheffield, where it divides, to reach the east coast through Lincoln, and the west coast through Manchester. In England the L. & N.E.R. touches the west coast only at the Mersey estuary and the Solway Firth.

(2.) The London, Midland and Scottish Railway (L.M.S.R.) includes the lines previously worked by the London and North Western (L.N.W.R.), the Midland (M.R.), the Lancashire and Yorkshire (L. & Y.R.), the Caledonian (C.R.), the Glasgow and South Western (G. & S.W.R.), and the Highland (H.R.), in addition to the lines of many less well-known companies.

The main English lines of this group link London with Carlisle. Two principal routes traverse the Midland Plain. The more easterly (the former M.R.) runs from London (St Pancras) through Bedford, Leicester,

Trent Junction, and Chesterfield, to Sheffield. Thence it is continued along the eastern foothills of the Pennine Chain to the Aire valley, which it ascends past Leeds to gain the upper Ribble valley, and reach Carlisle down Edendale. This line serves principally the Midland towns, the steel towns round Sheffield, and the West Riding woollen region. The westerly line (the West Coast Route to the north) runs from London (Euston) by Rugby and Stafford, to Crewe, a very important junction for North Wales (Holyhead for Ireland), Liverpool, Manchester, and Leeds. The main line travels north from Crewe, crosses the Mersey at Warrington, and runs along the Lancashire plain through Wigan and Preston to Lancaster, beyond which it climbs over the Cumbrian plateau to Carlisle. This line transports the products of the Black Country, the Potteries, and the Lancashire cotton district. The lines of the former L. & Y.R. serve the cotton and woollen areas, and connect Lancashire and the Mersey ports with the towns of the West Riding.

From Carlisle the Scottish midlands are reached by the valleys of the Annan and the Nith. The former route runs through Lockerbie to reach Clydesdale, and leads to both Glasgow and Edinburgh, *via* Carstairs; the latter, sending a branch from Dumfries to Stranraer, traverses the Ayrshire plain to reach Kilmarnock and Glasgow. From Carstairs, Edinburgh, and Glasgow lines lead to Stirling, and by Dunblane (branch through Callander to Oban) to Perth. From Perth the line traverses the Grampian Plateau by the Tay and Spey valleys to Inverness, and reaches Thurso and Wick by the coastal plain, sending a branch from Dingwall to the west coast at Strom Ferry and the



SCOTLAND—Principal Railways.

The old names are retained on the map to assist identification.

Kyle of Lochalsh. From Perth an important line runs through Strathmore to Aberdeen.

The most important industrial region of Scotland—the Clyde valley—is served by this system, which connects industrial areas with west coast ports.

(3.) The Great Western Railway (G.W.R.), which serves the area lying between a line joining London to Chester and a line joining London with Penzance, includes seven constituent companies, of which the former G.W.R. was the most important, and twenty-six subsidiary companies, most of which, like the majority of the constituent companies, operated in Wales.

One line runs north-westwards from London (Paddington) by High Wycombe, Warwick, and Birmingham, and through the Black Country to Shrewsbury, whence several lines radiate, mainly through Wales and the Severn Valley. Another main line of this group follows the course of the river Thames upwards by Windsor and Reading to Swindon, and then runs to the Severn estuary by Bath and Bristol. The Severn Tunnel ($4\frac{1}{2}$ miles long) carries the line into South Wales through Newport (Mon.), Cardiff, Swansea, and Llanelly (each with branches, forming a network into the coalfield) to Pembroke and Fishguard (for Ireland). South Wales may also be reached from Bristol by way of Gloucester. A third main line runs through Reading, Newbury, Westbury, Bruton (branch to Weymouth for the Channel Islands), Taunton (branch to Barnstaple), and Exeter, and along the south coast of Devon by Plymouth to Penzance. This route is connected with the immediately preceding by a line from Taunton to Bristol.

(4.) The Southern Railway (S.R.) includes as con-

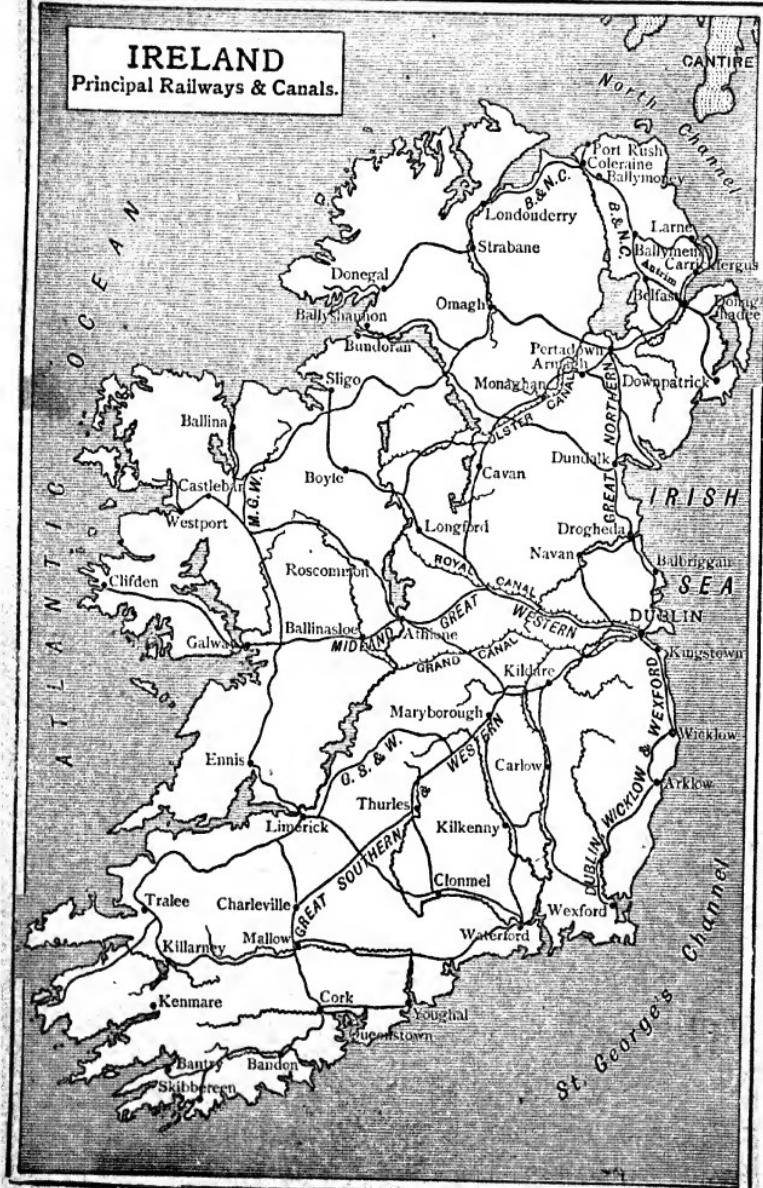
stituent companies the old London and South Western (L.S.W.R.), the London, Brighton and South Coast (L.B.S.C.R.), the South Eastern and Chatham (S.E. & C.R.)—formed by the amalgamation of the old London and South Eastern and the London, Chatham, and Dover Railways—along with a dozen subsidiary companies. Its lines link London (Waterloo, Victoria, and London Bridge) with the cross-Channel ports of Dover, Folkestone, Newhaven, and Southampton, with the naval stations of Chatham and Portsmouth, and with numerous inland and coastal resorts, including the Isle of Wight. The through route to the south-west runs from London (Waterloo) by Woking (branch to Portsmouth), Basingstoke (branch to Winchester and Southampton), Salisbury (branch to Poole and Dorchester), Yeovil Junction, and Exeter, whence lines reach the coastal resorts of North Devon, mid-Cornwall, and the port of Plymouth.

Irish Free State railways radiate from Dublin. The Dublin, Wicklow, and Wexford serves the counties named. The Great Southern and Western runs to Cork (and Limerick) by Kildare and Charleville, with branches to Kilkenny and Athlone. The Midland Great Western crosses the island to Galway, Clifden, Westport, and Sligo. The Great Northern (Ireland) unites Dublin to **Northern Ireland** (Belfast and Londonderry) through Drogheda and Dundalk, and the Northern Counties Railway joins Belfast and Londonderry through Antrim, and also runs to Larne.

Chief Trading Centres.—The internal trade of the British Isles is greater now than at any other period, and is also greater per head than that of any other country. Each mining or manufacturing centre has

IRELAND

Principal Railways & Canals.



its great trading town, where most of the business of buying and selling is carried on. Birmingham in the Black Country, Sheffield in the South Yorkshire iron district, Leeds in the woollen district, Manchester in the cotton district, Newcastle-on-Tyne in the northern coal and iron district, are the great commercial centres of industrial England. With the exception of Newcastle, these are all practically connected by a series of smaller towns. Cardiff is the commercial centre of South Wales. In Scotland, Glasgow, and in Ireland, Belfast and Dublin have become commercial capitals.

London.—London is a great central market, receiving commodities from all parts of the country and from abroad, and redistributing them both to home and foreign markets. Imported agricultural and food products of all kinds, such as tea, coffee, sugar, groceries, as well as all kinds of fancy goods and luxuries, are sent from it to other towns. In the same way coal, chiefly from the Midland coalfield, manufactured goods, jewellery, and hardware from Birmingham, cutlery from Sheffield, woollen goods from Yorkshire, and cotton goods from Lancashire, all pass through the wholesale London warehouses. Dairy, farm, and garden produce are brought from the country and the Continent to supply its great markets and feed its seven million inhabitants. Special fish and meat trains arrive during the night at the great London stations, loaded with food supplies, which are sold the next morning. The city and suburban traffic is carried on by the main lines of which it is the centre, and by two local lines, chiefly underground—the District and the Metropolitan.

The chief London markets are Billingsgate for fish; Smithfield

and Leadenhall for meat, game, and poultry ; Covent Garden and Smithfield for fruit and vegetables. There is a Metropolitan market for home cattle, and a Deptford market for foreign cattle.

Staffordshire.—Birmingham manufactures large quantities of jewellery, and is the centre of a district which produces hardware of every description. These wares are sent to London—whence they are largely redistributed to the great northern industrial towns—and to Gloucester, Liverpool, and Hull for shipment abroad. Like London and all large manufacturing centres, it obtains its food-supplies from home and foreign sources, receiving daily supplies of the more perishable, for the quick transport and delivery of which special arrangements are made by the railway companies.

The Staffordshire potteries and the Burton breweries distribute their goods in the same way.

South Lancashire.—Cotton goods, the staple of South Lancashire, are consigned from the surrounding districts to Manchester, whence they are shipped, or distributed to Liverpool, Hull, and other ports for shipment, and to all parts of the country for home consumption. The raw materials enter mainly by Liverpool or by the Manchester Ship-Canal; and large quantities of food and raw materials from foreign and colonial sources are imported by these routes.

Salt from the Cheshire mines and chemicals from South Lancashire are distributed to both the Lancashire and the Yorkshire manufacturing districts, as well as to other home and foreign centres.

West Riding of Yorkshire.—Leeds and Bradford serve as the emporia for the West Riding woollen centres, whose wares they distribute partly by rail and partly by sea, through the ports of the Humber and the Mersey.

Cutlery and armour-plates from Sheffield are distributed in the same way.

From Northumberland and Durham the London and North-Eastern Railway carries coal, iron goods, and chemicals to all the surrounding districts, and to Newcastle, Sunderland, Middlesbrough, and other ports.

The railways in the Lowlands of Scotland carry much coal to the ports for foreign trade, in addition to distributing it to the inland parts of the country. Railways and motor vehicles distribute the woollen goods of the Tweed valley, and share all the varied trade of the Glasgow district as well as that of other parts of the country.

Ports.—London is the port nearest the heart of the south-eastern region of England, and is opposite the great Continental ports, more particularly those at the mouth of the Rhine, with which a constantly active trade is carried on, not only from London, but from other ports on the east and south-east coast of England. The Continental packet stations, outports of London, are Harwich, Dover, Folkestone, Newhaven, and Southampton. Southampton has grown in recent years to be the port for great liners to the East and to Africa, and for London passengers to America. The western ports sprang into importance after the doubling of the Cape of Good Hope and the discovery of America. Bristol and Plymouth were the most important of these until the rise of great manufacturing centres round the South Wales, Midland, Lancashire and Yorkshire coalfields raised Liverpool, in the west, and Hull, in the east, to the rank of first-class ports. Other great Humber ports are Goole, Grimsby, and Immingham. Cardiff, Newport, and Swansea have grown with

the development of mining and metal-working on the South Wales coalfield. From early times Newcastle shipped coal to London; but the other Northumberland and Durham ports, North Shields, Tynemouth, Sunderland, together with Middlesbrough, in Yorkshire, have become important only in recent years with the development of coal and iron industries and the manufacture of chemicals. Silloth is the port for this region in the west, and south of it Maryport, Workington, and Whitehaven are outlets for the Cumberland coalfields.

In Scotland, as in England, the east coast ports were long the most important, and trade was carried on, more particularly with France, through Leith. Now Leith, Grangemouth, Burntisland, and Dundee still carry on an extensive coasting and Continental trade; while the Clyde has become the busiest commercial centre in Scotland. Greenock, Glasgow, and Ardrossan are the chief ports. Aberdeen sends out fish and manufactured goods.

The ports of Northern Ireland (Belfast), and the Irish Free State (Dublin, Waterford, and Cork), are all in the east or in the south, nearest Britain and the Continent, and serve as outlets for agricultural products and salmon, and as inlets for manufactured goods from Great Britain. The east coast is not only nearest the richest land of Ireland, but is opposite Great Britain. The west coast has numerous natural harbours; but a natural harbour alone does not suffice to make a port, which must have easy communication with land producing commodities for which there is a demand. The west of Ireland is chiefly pastoral, and supports only a coasting trade. Limerick,

which forms the outlet for the Golden Vale, is by far the most important port on the west coast.

The routes between Great Britain and Ireland are numerous. Scotland sends goods and passengers from Glasgow and Greenock to Londonderry, Belfast, and Dublin; and swift boats run daily between Ardrossan and Belfast, and between Stranraer and Larne, the latter the shortest sea-route between the two islands. The north of England ports, Barrow, Fleetwood, and Liverpool, do a large cross-Channel trade with Belfast, and also trade with the Isle of Man. Liverpool is also directly connected with Drogheada, Dublin, Cork, and other ports. The quickest service from London to Dublin is by the mail route *via* Holyhead to Kingstown or Dublin direct. New Milford and Bristol are in regular communication with Waterford and Cork.

All the ports of the British Isles have regular steam communication with each other every few days.

Train-ferries have been used across the English Channel.

CHAPTER VI.

OUR FOOD-SUPPLY.

IN olden times our country was dependent on its own products for the food of its inhabitants, who were forced to subsist on what could be grown in their own immediate neighbourhood. In bad years considerable distress was therefore felt, while actual famines were not unknown. The choice of food was also more limited than at present, and some districts offered less variety than others.

In the Tweed valley servants formerly stipulated for a clause in their contracts forbidding salmon to be served more than three times a week. Nowadays few masters feed their servants on salmon even three times a year. It is no longer the commonest

fare either in Tweeddale or elsewhere, but is a luxury within the reach only of the well-to-do. Its value has increased even in regions where it is abundant, while the value of other foods has fallen. No doubt salmon have become scarcer, but the change in relative value is in large part due to the development of transport facilities, which permit salmon to be forwarded to distant markets, and other kinds of food to be cheaply brought from other parts.

This increase in transport facilities is part of a general economic change which has come over this country during the last century and a half, transforming Great Britain into a great manufacturing country. The increased power of production resulting from the use of steam and other forms of power has led to an enormously rapid increase of population, especially in the non-agricultural section of the community. The home food-supply has not kept pace with this increase of population, and the bulk of our food now comes from the uttermost parts of the earth in great steamers which occupy only a few weeks on the voyage. About £700,000,000 are spent annually on imported food.

Food products, using the term in the widest sense, may be divided into cereals, fish, flesh, dairy produce, fruits, and drinks. The cereal most in demand is wheat. It is long since the wheat-lands of Britain ceased to supply enough wheat for the people of the United Kingdom, and since the removal of the heavy duties once levied on foreign wheat the import of this cereal has gone up by leaps and bounds. At the present day about 80 per cent. of our wheat and wheat-flour is imported.

The last fifty years have been marked by a steady exodus for the colonisation and cultivation of many lands formerly occupied by wandering hunters or

herdsman. The extension of the wheat-growing area abroad has enormously increased the world's food-supply, and has created a surplus which is sent mainly to Europe, and very largely to the United Kingdom. The most important of these new wheat-lands are the North American prairies, west of the Appalachians and the Great Lakes. In Europe, the *pusztas* of Hungary, the Wallachian plain, and the rich black lands of southern Russia are well suited for wheat. All these regions are relatively sparsely peopled, and in some—for example, in Romania—maize and not wheat is the grain consumed by the inhabitants themselves. There is consequently a surplus for export to western Europe. In India excellent wheat is grown in the north-west under irrigation. The Plate basin in South America is another source of our wheat supply, and its resources are as yet by no means fully developed. Australia sends irregular supplies, for there the harvest is sometimes ruined by drought. In addition to these there are two vast areas which are gradually being developed, and will be made to produce enormous supplies of wheat. These are the plains of western Canada and southern Siberia. Until these virgin lands are more or less exhausted, there will be a natural increase in the world's wheat-supply; but in a few decades a more careful and intensive cultivation of the wheat regions will be essential, as most of the available free land will doubtless in that time be fully utilised, even in the higher lands of Africa.

American wheat is sent east to the Atlantic ports, more particularly to New York, Boston, Montreal, and Quebec, by the great railways of the United States and Canada, and the Great Lakes and the canals which connect them either with the

Hudson or the St Lawrence. Much United States wheat is exported in the form of flour, ground largely at Minneapolis, on the Mississippi, at the foot of the great St Anthony Falls, which supply water-power for turning the numerous flour-mills. The finest flour is imported into this country from Hungary, and it is remarkable that this is superior to that ground in this country from Hungarian wheat. Hungarian wheat is exported partly from the port of Fiume on the Adriatic, but most of the Danube valley crop finds its way down the river to Braila and Galatz, near its mouth, whence the Romanian supplies are dispatched. Indian wheat is shipped mainly from Karachi; Australian from Sydney, Melbourne, and Adelaide; South American from the Plate River and Bahia Blanca. The Russian wheat trade has been very small since the Great War.

In 1922, 38 per cent. of our imported wheat and flour came from the United States, 27 per cent. from Canada, 19 per cent. from Argentina, and 16 per cent. from Australia. Indian supplies are increasing; other supplies are still small—a legacy of the war.

Maize, the cereal next in importance, is imported more as a feeding substance for our live-stock than for human food, though much is turned into corn-flour at Paisley and elsewhere. The chief source until recent years was the central Mississippi basin, but Argentina now sends the bulk of our supplies. Maize is also imported from Romania and South Africa.

The other cereals, more particularly barley, oats,* and rye, and the pulses—peas and beans—are also largely imported. Barley is chiefly used for brewing and distilling, and is imported mainly from the United States, Canada, Turkey, North Africa, and Denmark.

* Oats come from the United States, Argentina, and Canada, rye and peas from the United States and Canada, and beans from China, Turkey, and Egypt.

The other substances named are employed more for feeding stock than for human food.

Rice, the only other important cereal, is brought from Burma through Rangoon, and from Bengal.

Dairy Produce and Eggs.—Butter and margarine, cheese, eggs, and milk are important articles of food which our dairies and poultry-farms do not supply in sufficient quantity.

Denmark and the Irish Free State supply most of our imported butter. Sweden, Holland, and northern France send supplies, which can be delivered in our markets before they have time to deteriorate in quality. In recent years refrigerating processes have enabled dairy produce to be brought fresh from the farthest regions, and Siberian, New Zealand, Australian, American, and Canadian butter are now imported. Cheese comes principally from Canada, where careful technical education has made the farmers of Ontario the most skilful cheese-makers in the world. It is also imported from the northern United States, Holland, Belgium, Switzerland, France, and New Zealand. About 1750 millions of eggs are obtained annually from Ireland, the countries around the North Sea, and Italy. Considerable numbers come from Canada, and even from Egypt and China, which also supplies dried eggs. Condensed milk is imported from Switzerland and Norway.

Fish.—The home supply of fish is very large, and more is exported than imported. Fresh herrings are brought from Scandinavia, other kinds of fresh fish from Norway and Holland, and oysters from the United States and France. Frozen salmon from Canada is becoming common in the markets of London and the

larger ports, and canned salmon, lobsters, and oysters are imported in large quantities from Canada and the United States. Sardines, preserved in oil, are imported from French and Portuguese fisheries, and anchovies, in oil or brine, are obtained from Italy and Norway. Norway also sends us several varieties of canned fish.

Flesh.—Meat is imported partly in the form of live animals, partly as dead carcasses, partly as salted or preserved meat. Live cattle are sent mainly from the Irish Free State, the United States, and Canada, through their eastern ports. From Argentina, the United States, Australia, and New Zealand large quantities of dead meat are brought over in ships fitted with refrigerating chambers. Sheep are imported from the Argentine Republic, the United States, Canada, and even from Iceland. Frozen mutton is brought from New Zealand, Australia, and South America. Fresh mutton is imported in considerable quantities from Holland. Fresh pork is imported from Holland and the United States. Bacon and ham come mainly from Ireland, the United States, and Denmark; a little from Canada. Beef and pork, salted or preserved in other ways, come mainly from the United States. Corned mutton is brought principally from New Zealand and Australia. Meat extracts are imported from Uruguay.

Poultry and Game are brought from various parts of the Continent; dead rabbits from Belgium and from Australia. In the latter country they have long been a pest; but they are now killed for their flesh, part of which is canned, and for their skins.

Fruits.—In recent years, since refrigeration has rendered it possible to bring even the more delicate

fruits from distant parts of the world without deterioration, fruit has become a much more important article of diet in this country. Of temperate fruits the apple is the most important. The home supply is quite inadequate, and several million bushels are imported annually, chiefly from the United States, Canada, and Normandy, though the supply from Australia is increasing. Subtropical fruits are obtained from lands having a Mediterranean type of climate. They include oranges, lemons, figs, grapes—either fresh or dried into raisins and currants—almonds, and dates—the last from the borders and oases of the desert. Of tropical fruits the banana is most in demand. It is imported in immense quantities from the Canary Islands, the West Indies, and other countries lying between the tropics. The more expensive pine-apple comes from the same sources. The coco-nut is brought from various intertropical regions, but chiefly from the islands of the South Pacific and Indian Oceans.

A large trade is done in fruits preserved in bottles and cans. Apricots, pears, and other fruits are bottled in France, and are finer in quality and higher in price than the many canned fruits imported from the southern United States, California, the East Indies, and Australia. In addition to currants, raisins, and prunes, dried plums and Normandy pippins have long been in use, and dried pears and apricots have an established place on the market.

Sugar.—Sugar not only forms part of our daily food, but is also the medium in which most fruits are preserved. It is found in every plant, and most fruits are rich in it. Several plants, such as the sugar-cane, sugar-beet, sugar-maple, and sorghum, are cultivated

for the sugar they yield. The sugar-cane grows only in warm, moist regions, and is cultivated in every part of them. It was formerly the staple product of the West Indies, where it is still largely cultivated, as well as in adjacent lands like British Guiana. It is also grown in the East Indies and Queensland. Our chief supplies of cane sugar come from these countries (excluding Queensland). The West Indian sugar trade has suffered during the last century from the competition of beet sugar. The Napoleonic wars at the commencement of the nineteenth century deprived the continental European countries of West Indian sugar, and obliged them to depend on that obtained from the sugar-beet, which could be grown in Europe. This led to a great increase in the cultivation of this plant in the north of France and Germany, in Belgium, Bohemia, and parts of southern Russia. The sugar-beet is beginning to be grown in this country, for the climate is suitable, but beet sugar (principally from Germany, France, and the Low Countries) forms about two-thirds of our imported raw sugar.

Spices, Flavourings, &c.—In former times, when salted and dried foods were so largely consumed in winter, spices were relatively a much more important article of diet than now, though they are still largely used. From the East Indies, one of the chief spice-lands, come the nutmeg kernel and its covering layer the mace, the dried pepper-berry, and the ginger-root. Ginger is obtained from the East and West Indies, and cardamoms from India. The bark of the cinnamon-tree is imported from Ceylon. Zanzibar exports the dried buds of the clove, and Jamaica is the principal source of the pimento or allspice. Vanilla, used for flavouring,

is produced by an orchid growing in India, Central America, and Mexico. Almond-oil is extracted from almond seeds. The chief oil extensively used as a food is olive-oil from the olive drupe, the finest qualities coming from the south of France, Italy, and Tunis.

Ice.—Nearly half a million tons of ice are imported annually, chiefly from Scandinavia, for preserving and cooling food in summer.

Stimulants and Narcotics.—Stimulants may be divided into aromatic drinks prepared by infusion and those obtained by fermentation. The former owe their stimulating property to the presence of alkaloids, the latter to that of alcohol.

Tea.—In the British Isles tea is the most important non-alcoholic beverage. It is made by infusing the dried leaves of the tea-plant, which grows well in regions with very warm and moist summers where the slope of the land is sufficient to ensure good drainage. Formerly nearly all our tea was imported from China; but in recent years the slopes of Assam, Darjiling, and other mountainous parts of India, and the mountains of Ceylon, have supplied the greater portion of the tea used in this country. China tea was shipped from Hankow and other Yang-tse-kiang ports, and from Shanghai and Canton. Indian tea is shipped mainly from Calcutta, and Ceylon tea from Colombo. Tea is now grown in Natal, Nyasaland, Java, Jamaica, and other regions with suitable climates, and might well be introduced into northern Queensland.

The consumption of tea is rapidly increasing in this country: 160,000,000 lb. were consumed in 1880, while in 1922, 411,000,000 lb. were imported for home consumption, or almost $8\frac{1}{2}$ lb. for each inhabitant.

Coffee is an infusion of the roasted and ground berry of the coffee-plant, which, like cotton, but unlike tea, cannot stand any frost. Most of our coffee comes from the Pacific slope of Central America, Brazil, British East Africa, and the West Indies. Brazil and the Dutch East Indies, especially Java, are among the chief coffee-producing regions. Indian coffee comes from the south of that country; very little is now obtained from Ceylon. Coffee has also been introduced into Nyasaland, where a 'bean' of very fine quality is grown.

The consumption of coffee in the British Isles is diminishing, but 1,000,000 cwt. are imported every year, of which about two-thirds is re-exported.

Cacao.—Cacao, commonly, but wrongly, called cocoa, is made from the 'nibs' or seeds of the cacao-tree, a plant of American origin which flourishes in Mexico, Central America, the north of South America, and the West Indies, and has been successfully introduced into Ceylon and West Africa. The cacao of Ecuador is shipped from Guayaquil; that of Venezuela from La Guaira; that of Trinidad from Port of Spain. It is also exported from the Gold Coast, São Thome (in the Gulf of Guinea) and Java. The consumption is increasing.

The **kola** nut, from West Africa, yields one of the strongest of all non-alcoholic stimulants. It is used medicinally, and is rapidly passing into common use.

Fermented Drinks.—The alcoholic drinks fermented from barley have already been described (see page 61).

Wine, the fermented juice of the grape, is by far the most important alcoholic drink which is imported. Although the vine can be grown in the south of England and Wales, it is at present of no economic

importance, and wine is obtained chiefly from the vine-growing regions of France. Champagne is prepared in the Marne basin at Reims and Epernay. Clarets are exported from Bordeaux, and Burgundies from the Saône valley. Wine is also imported from Spain (sherry), Portugal (port), Italy, Germany (Rhine wines), and Hungary. Algeria, in the north of Africa, and the Cape, in the south, both export wine. In recent years considerable attention has been paid to vine-growing and wine fermentation in Australia, more particularly in Victoria and South Australia. Californian wines are also now in the British market. The distilled liquor obtained from wine is brandy. The best brandies are made at Cognac, in the west of France, and in the Champagne region.

A portion of the spirits imported into this country is distilled in Germany from the fermented juice of the potato. Rum, the spirit of sugar, comes from the British West Indies and British Guiana. Fine liqueurs are prepared by the Benedictine monks in Picardy and those of Chartreuse in Savoy. Among many others too numerous to mention may be noticed Kirsch, distilled from the cherry, and Curaçoa, made in Holland from the outer rind of the Curaçao orange. Practically every plant can be made to yield alcohol, and numerous fruits and plants are used for the purpose.

Tobacco and Snuff are made from the prepared leaves of the tobacco-plant, a native of America. The tobacco-leaf is rolled into cigars or cheroots, and in this form it is brought from Havana in Cuba, Manila in the Philippines, and from Mexico, Borneo, Burma, and southern India. Tobacco for smoking and snuffing is imported from the United States several countries of

Europe, and the Levant. Much is imported in the form of dried leaves, which are manufactured into pipe tobacco, cigars, cigarettes, and snuff in our own country.

CHAPTER VII.

IMPORTS OF RAW MATERIALS AND MANUFACTURED ARTICLES.

Raw Materials for Textile Manufacture.—Wool and flax are the only two fibres of textile importance grown in the British Isles, but the home supply of both is quite inadequate. Cotton, hemp, jute, and other vegetable fibres, and silk, camels' hair, and other animal fibres, are all of foreign origin.

Wool.—Most of our imported wool comes from the southern hemisphere, where the merino sheep has been introduced. The chief wool-producing regions are Argentina, South Africa, Australia (south of 20° S. lat.), and New Zealand. Argentina exports little wool used in this country, which is chiefly supplied from Australasia and South Africa. The Australian grass-lands are the drier downs south of the twentieth parallel. The wool, which is washed on the sheep-runs before being forwarded to the coast, is exported from the chief ports of the five colonies. In New Zealand the Canterbury plains in the South Island are exceptionally suited for sheep-rearing, although sheep are very numerous on the drier parts of the western mountains. In South Africa the dry Karroos supply scanty pasture. Cape Colony wool, however, is less in demand than Australian, largely

because it is exported uncleaned. Its heavier weight increases the cost of transport, while the manufacturer has also to pay the cost of cleaning. This is still more true of South American wools. The proportion of cleaned wool exported is steadily increasing.

There are numerous minor regions of wool-supply. For instance, sheep-rearing is almost the only industry of the Falkland Islanders.

The hair of the goat is also used for making woollen goods, especially that of the Kashmir goat and the Angora goat of Asia Minor. The latter has been successfully introduced into South Africa, and its fine hair, known as mohair, is a valuable export from our colonies there. The hair of the camel and of the alpaca of the Andes is also used in the woollen manufacture.

800,000,000 to 900,000,000 lb. of wool are imported on an average every year, of which less than half is re-exported. The home production is usually between 100,000,000 and 120,000,000 lb. The total amount of raw wool annually manufactured in the United Kingdom is about 800,000,000 lb.

Flax.—In addition to the flax grown in Ulster, lint fibre is imported, mainly from the Baltic, and especially from Latvian ports. The finest flax, however, is produced in the south of Belgium, which sends one-fifth of our imports. We are also supplied from Holland. A considerable quantity of flax is produced in southern Russia, in northern Italy, and in western France, but is not brought to Britain. At present the annual import is no greater than the home production.

Cotton.—One-quarter of the world's raw cotton is sent to be manufactured in the British Isles. Cotton consists of the fine hairs growing round the fruit of the cotton shrub, or tree, which is found everywhere

between the tropics, and also in subtropical regions. The hair is separated from the seeds by the process called ginning, and the 'cotton wool' is then packed into bales weighing about 480 lb. each. In the sixties about 12,000,000 cwt. of raw cotton were imported every year; but the quantity is now about 20,000,000 cwt., of which over 12 per cent. is re-exported.

The United States of America are by far the most important source of our cotton-supply, for two-thirds of the raw cotton of the world is grown there. The cotton-plant cannot flourish in regions where frost occurs, and while it does not require exceptionally great moisture, it needs long, warm summers to ripen the seeds. The south-eastern United States have a climate admirably suited for its growth, and in the sandy soils of Georgia and South Carolina plants producing the finest and longest fibres are raised. This is known as 'sea-island' cotton, which has been introduced from this region into Egypt, Queensland, and different islands in the Pacific. The American ports chiefly engaged in shipping sea-island cotton are Charleston, Savannah, and Wilmington. A cotton with a shorter staple, known as 'upland' cotton, is grown farther inland. This is largely shipped from the Gulf ports, such as Galveston, New Orleans, Pensacola, and Mobile.

The delta of the Nile, with its very dry air and abundant moisture derived from the river, is well suited for the growth of fine cotton; and Cyprus and other parts of the Mediterranean are equally good cotton lands. Much cotton is shipped to this country from Alexandria and Smyrna.

The black soil of the Deccan in India to the east of the Western Ghâts, where the summer rains are not excessive, yields rich crops, which are shipped chiefly from Bombay. Of the minor cotton-growing regions, Peru and Brazil are the most important. The raw cotton is shipped from Callao, Rio de Janeiro, and Pernambuco. Attempts are being made to increase the growth of cotton in British lands, especially in Africa, from which in time a large supply may be expected.

Silk.—Over 1,000,000 lb., about £2,000,000 worth, of raw silk is imported into the United Kingdom every year; about the same value of husks and waste, and over £1,000,000 worth of thrown silk are also imported annually. Silk is obtained from the cocoon of the silk-worm, which feeds on the leaves of the mulberry, oak, and other trees of China, Japan, the Mediterranean region, and other parts of the world. Most of our supply comes from France, China, and Japan.

Jute.—Jute is the coarse fibre obtained from the jute-plant, which grows only in the rich alluvial soils of warm, moist regions. The bulk of our supply, about 250,000 tons per annum, comes from the Ganges delta. It is shipped from Calcutta, which now manufactures large quantities, and competes with our home industry.

Hemp.—Hemp is widely distributed; but most of that used in this country is imported from Russia, Germany, and Italy. Manila hemp, the long fibre of a palm, is imported in very large quantities from Manila in the Philippine Islands. New Zealand produces a fibre known as phormium, or New Zealand flax. The agave of Mexico and Central America yields a fibre known as henequen, or sisal hemp, used in the manufacture of twine, rope, &c.

The ramie or China grass is the fibre of a plant of the nettle family, grown in many warm lands.

Other Raw Materials of Vegetable and Animal Origin.

Palm-oil, from moist and hot West Africa, and the dried coco-nut, known as copra, from most Pacific islands and the sandy shores of the Indian Ocean, are imported for making soaps and stearine candles. Many trees in the wet jungles of intertropical regions exude a milky juice which when dry becomes elastic, and is known as rubber, or as gutta-percha. The Brazilian forests supply the best rubber. The port is Pará, at the mouth of the Amazon. Rubber is also imported from West Africa, and from the East Indies, through Singapore. A variety of plants growing on the borders of the desert exude juices which form gums and resins imported either for use as drugs or as the bases of varnishes, dyes, or compounds employed in tanning. They are chiefly brought from East Africa and Arabia.

Substances imported for Tanning and Dyeing.—Tannin, an astringent found in most tree-barks, is used for tanning hides into leather. Some barks are richer in tannin than others. Among those imported into this country are the bark of the hemlock-spruce from the United States, of an acacia from Natal and Australia, and of an oak from the Mediterranean, from the east of which region come the acorn-cups known as valonia, also used in tanning.

Vegetable dyes have become less important since the introduction of aniline dyes. Indigo, the most important, is extracted from the stems of a plant of the pea family, cultivated mainly in Bengal, whence,

however, little is now exported. Some is brought from the West Indies and Central America. Cutch, or catechu, extracted from an acacia, is largely imported from India. Gambier, prepared from the young astringent leaves of a tree growing round the Strait of Malacca, and gamboge, a yellow viscid juice which exudes from the gamboge-tree of Cambodia and is collected in hollow bamboo stems, are imported from the Indo-China peninsula. The finest gamboge comes from Siam. Madder was formerly cultivated for making turkey-red; but alizarin, the colouring matter of this dye, is now obtained from one of the coal-tar products. Many dye-woods, such as logwood, come from Central America.

Of animal dyes, red cochineal is perhaps the most important. It is made from an insect which feeds on the cactus, and is obtained mainly from the Canary Islands. Mineral aniline dyes, made from coal-tar, are imported from Germany.

Timber and Cabinet Woods.—The forests of our country have long been exhausted, and nearly all the timber used in this country is imported.

Redwood and whitewood from the Baltic are used for all kinds of building purposes. The former is also employed, as is New Zealand kauri pine, for finer kinds of joiner-work, the latter for coarser carpentry. Yellow pine comes from Canada and the northern United States, and the beautifully-marked and resinous pitch-pine from the forests of the east of the Appalachians. The great Douglas pine of British Columbia and Oregon, and the Californian redwood, are magnificent specimens of timber, being sometimes as much as three hundred feet in height. The former is used for making masts,

and as both are free from knots, they are among the most valuable timber imported. Oak is brought both from the continent of Europe and from America, and the hard and durable teak is shipped from India, especially from Burma. West Australian jarrah and karri woods are used in street paving, &c. Walnut from the south of Europe, the United States, and Canada, and mahogany from tropical America, are employed in high-class joiner-work and cabinet-making. Many other beautiful woods are imported for the latter purpose, mainly from tropical lands—for example, Brazilian rosewood; the satinwoods of the West Indies, southern India, and Ceylon; ebony from Ceylon; and bird's-eye maple from North America.

Much wood is imported in the form of pulp for paper-making, mainly from Scandinavia and Canada.

The bark of the cork oak, both raw and manufactured, is imported from Spain and Portugal.

Furs and other Animal Products.—Furs are largely imported for winter wear. Siberia, northern Russia, and Canada are the last great fur-preserves of the world. The ermine, fox, beaver, mink, and sable are among the animals hunted for their skins. The fur seal-fisheries of the Arctic seas are confined to the Pribilov Islands, and the skins fetch a high price. Much of the catch of the Canadian and United States sealing fleets in the North Pacific finds its way to London, one of the great fur-markets of the world. Whale-fisheries, important now only in the Southern Ocean, yield valuable whalebone and blubber, the latter used for oil. The recent development of the bicycling trade has created a great demand for walrus-skins, which make the best burnishers, and these fisheries

will rapidly reduce the numbers of walrus in Arctic waters. The skins of the tiger, lion, leopard, and grizzly bear are prepared as ornamental and useful rugs. By far the largest number of skins and hides brought into this country are those of common animals, such as cattle, sheep, goats, and horses, to be converted into leather. These are chiefly obtained from the pastoral regions of Australia, North and South America, and South Africa.

Elephants' tusks, or ivory, are imported mainly from Africa, where the supply is becoming rapidly exhausted. The teeth of the hippopotamus and the walrus are also collected for the ivory market.

The feathers of the African ostrich are in great demand, and ostriches are reared now, not merely in South Africa and in Algeria, but also in the United States, Australia, and Argentina.

The feathers of other birds are also imported for ornament, and those of the domestic fowls and of the eider-duck, the down of which is gathered from the islands of the North Atlantic and from Norway, are brought to stuff cushions, quilts, and other soft and warm articles.

Sponges are brought from the Mediterranean and from the West Indies.

Imported Minerals.

Besides the precious metals—gold, silver, and a small quantity of platinum—the common metals—iron, copper, tin, zinc, mercury, lead, and manganese—are the chief metals imported into the British Isles.

Iron.—Enormous as is the output of iron ore from British mines, it does not suffice for the numerous

furnaces of the United Kingdom, and between 5,000,000 and 6,000,000 tons of ore are annually imported, one-half from Spain. The red hematite iron ores of the north of Spain are shipped from Bilbao to South Wales. The black magnetic iron ores of Sweden are still largely used in making cutlery at Sheffield.

Copper.—The development of electrical engineering has led to a great increase in the use of copper, which is found in a pure state in some parts of Russia and near Lake Superior. About 100,000 tons are annually imported, the greater part either as ore, as partly refined ore known as regulus or copper precipitate, or as unwrought blocks. It is sent from the Sierra Morena, in Spain, through Huelva; from the Ookiep mines, in the west of Cape Colony, through Port Nolloth; and from the United States, Australia, and Chile. Copper-smelting is mainly carried on in South Wales (especially round Swansea), Lancashire, and Lanarkshire.

Lead and Manganese.—Between 150,000 and 200,000 tons of lead are imported annually. Most of the lead is obtained from Spain, Australasia, and the United States, where it is found as a sulphur-lead ore known as galena. Manganese comes from Russia, India, Chile, Brazil, and Turkey, mainly in the form of the black oxide, which is used for making manganese steel. Over 300,000 tons of ore are imported annually.

Zinc.—About 100,000 tons of crude zinc are annually imported, largely from Belgium, Germany, and the United States; over 6000 tons of zinc oxide, and ores, principally from Italy and Greece, and in growing quantities from Tunis, Spain, and Australia.

Tin.—About 25,000 tons of tin, and 40,000 tons of tin ore, are brought, three-fifths of the former from the

Malay Peninsula, through Singapore; three-quarters of the latter from South America, mainly from Bolivia.

Mercury is largely used for making alloys, called amalgams, and in the refining of gold. Nearly all is derived from Almaden, in the Siérra Morena in Spain. About 2 000,000 lb. are imported every year.

Many other minerals are imported in smaller quantities, to be used pure or in combination with other metals.

Platinum is obtained from the Ural Mountains. It is not acted on by the atmosphere or any single acid, and it is very ductile and malleable, but not easily melted. It is used in electrical and chemical works.

Nickel, used in making nickel steel, and alloyed with copper to form German or nickel silver, comes mainly from New Caledonia. It is found in the Sudbury mines near Lake Superior, in Canada, and in various parts of the United States, as well as of Europe.

Sulphur, used in making sulphuric acid, is brought from many volcanic regions, more particularly from those of Italy.

Graphite, or plumbago, forms the lead of our pencils, and is also used as a lubricator and polisher. Since the once-famous Cumberland mines were exhausted, it is imported from Ceylon, Germany, and the United States.

Nitrate of Soda, or Chile saltpetre, found in the desert regions of South America, is imported for fertilising purposes. For this purpose many phosphates are brought from the south-eastern United States, but they have to be treated with sulphuric acid before they are used.

The fireproof asbestos is brought from Canada and Italy.

Over 250,000,000 gallons of crude petroleum, and about 1,000,000,000 gallons of refined petroleum, are imported from the wells at Baku, east of the Caucasus, through the Black Sea ports of Batum and Poti, from the Pennsylvanian and other oil-wells of the United States, from Mexico, Rumania, Persia, and other lands.

Asphalt is obtained from the pitch-lake in Trinidad.

Both **silver** and **gold** are largely imported into this country, not merely for coinage, but for use in the arts. Gold is chiefly extracted from the so-called gold quartz. The quartz is first crushed, and then the gold is taken out by chemical or mechanical processes. It is also washed from alluvial sands formed by the decomposition of gold quartz. The Transvaal, Rhodesia, West Africa, Australia, and North America are the principal sources of the gold brought to this country. Silver is not usually found pure. Large quantities are got from lead-silver ores, in which it is found in small quantities. It is abundant in the Andes, Mexico, Nevada and Montana in the United States, and in Australia.

Precious Stones.—Diamonds are found in South Africa, especially at Kimberley and in the Transvaal, and also in Brazil. Rubies and sapphires are brought from Burma and Ceylon; emeralds from Colombia.

Pearls, the only precious stones of organic origin, can now be artificially produced in oyster farms. They come from the Persian Gulf, Ceylon, the Sulu Archipelago, and the coasts of New Guinea and Northern Australia.

Manufactured Articles Imported.

Many manufactured articles are brought into the United Kingdom in spite of the great activity of its factories. Some of these, such as Turkey carpets or

Sèvres porcelain, are fine articles brought from regions specially famous for their manufacture. Others are common articles which other countries can put cheaply on our market. Many partially manufactured goods, such as cotton, woollen, and linen yarns, are sent to Britain for further elaboration.

A considerable proportion of these imported manufactured articles is immediately reshipped to our colonies and other lands with which we trade.

Cotton piece-goods covering an area of over 30,000,000 square yards, or nearly 10 square miles, are brought to this country every year, and over half that area of woollen cloths and stuffs. Many of the imported fabrics are of very fine quality and design. The woollens come mainly from France, where the finest qualities are made, and from Germany.

Both woollen and cotton goods are introduced in a further stage of elaboration, as hosiery and other articles of dress.

We spend on an average £7,000,000 per annum on imported manufactured cotton goods, and £5,000,000 on imported manufactured woollens, including carpets.

Most of the silk used in this country is manufactured abroad, in France, Germany, or Italy; and about £12,000,000 are annually paid for manufactured silk brought into this country.

Paris and Berlin supply mantles and many other articles of clothing, the French imports being remarkable for elegance and the German for cheapness.

Over £9,000,000 are spent every year on prepared leather, and £1,000,000 on boots and shoes. Twenty-six million pairs of gloves are annually imported from Paris, Grenoble, Brussels, and Copenhagen.

Lace, buttons, studs, and much haberdashery are brought from the Continent.

Many articles of household use are also imported. China, porcelain, and earthenware are brought from the great Continental potteries at Limoges and Sèvres.

Kitchen utensils and tin-plate ware are largely obtained from the United States; cheap cutlery from the same country and from Germany.

Germany supplies many of the chemical manufactures; glass is brought from Germany, Bohemia, and Belgium; paper from Scandinavia, Germany, and U.S.A.

Many scientific instruments are also of German and French manufacture. £1,000,000 are spent annually on musical instruments, brought chiefly from Germany.

Cheap wooden matches are imported from Scandinavia, and wax ones from Belgium.

About £1,000,000 are spent every year on watches, and £600,000 on clocks, of foreign manufacture.

The growth in our imports of manufactured iron is one of the most remarkable phenomena in recent years. Nearly £15,000,000 are spent on foreign manufactured iron, not much under one-fourth of the value of our exports. Much of this comes from the United States, Belgium, and Germany. In 1922, about £7,000,000 were spent on motor-cars and cycles.

CHAPTER VIII.

EXPORTS.

Exports and Imports.—The trade relations of this country are very complex. Britain plays the part of a great middleman, acting as an agent between buyers

and sellers in all parts of the world. It trades not merely in its own surplus produce—raw and manufactured—but in almost every article of colonial and foreign produce—raw and manufactured—in which a profitable trade can be done. An immense number of commodities, therefore, are imported only to be re-exported, chiefly through London. The existence of this entrepôt trade, as it is called, must always be borne in mind in studying lists of our imports and exports.

Home and Foreign Produce.—With the exception of coal, most of our raw exports are first imported. Cotton, wool, the skins of sheep and other animals, tallow and animal fat, jute, rubber, and many other forms of raw produce, as well as large quantities of food-stuffs, which are included among our exports, are all of foreign origin. On the other hand, manufactured articles, which figure so largely among our exports, are chiefly, though not exclusively, of home origin.

Mineral Exports—Raw and Manufactured (chiefly of Home Origin).—Coal is by far the most important mineral exported, amounting in value to one-tenth of the total exports of the country. About 70,000,000 tons, or 27 per cent. of the total output of British mines, were exported in 1922, but 77,000,000 tons in 1913. Large quantities are sent to countries bordering the North and Mediterranean Seas, which have little or no coal of their own, such as Scandinavia, Finland, Denmark, Holland, Spain, Portugal, Italy, and Egypt, and to those parts of coal-producing countries, such as Germany, France, and Russia, which are more cheaply reached by boat from Britain than by rail from the

home collieries. Welsh coal is sent all over the world, and supplies the coaling stations for the British navy as well as the vessels themselves.

Between 18,000,000 and 20,000,000 tons of coal are shipped for the use of steamers engaged in the foreign trade, and are not usually reckoned among exports proper.

Iron is exported in many different forms. The quantity of simple pig iron exported was over 650,000 tons in 1922. Railroad plant of all kinds is sent to nearly all the countries of the world, more particularly to European countries and to the East Indies. It amounts to about 500,000 tons.

Tin plates and galvanised iron sheets together average annually about 1,000,000 tons.

Cast and wrought iron, unwrought steel, hoops, sheets, boiler plates, wire, bar, angle, and rod iron are among the other forms in which this metal is exported, to a weight of about 800,000 tons per annum.

The total value of iron and steel and manufactures thereof exported in 1922 was over £60,000,000.

Iron is the principal constituent of such exports as cutlery, hardware, and tools, of which more than £4,000,000 worth are annually exported; of cycles and motor-cars, £5,700,000; of locomotives, agricultural and other steam-engines, £10,000,000; of textile, agricultural, and other machines and implements. The total amount of all machinery and mill-work exported, including steam-engines, was valued at over £50,000,000 in 1922.

Among miscellaneous exports included under the head of metals, the most important are wrought and

unwrought copper, brass, lead, tin, zinc, telegraph apparatus of all kinds, electroplate, small firearms, guns and ammunition, clocks and watches, and others too numerous to mention.

The total exports of metals and articles manufactured from them, including ships, was valued at over £187,000,000 in 1922, or nearly one-fourth of the total exports of British origin.

Textile Exports (chiefly of Home Manufacture).—Our textile exports are numerous and valuable. Cotton yarns and manufactured goods make up about one-quarter of the domestic exports of this country, and woollen yarn and manufactures nearly one-twelfth, the exact quantity varying from year to year. Over 4,000,000,000 square yards of cotton piece-goods, nearly half unbleached, are exported annually to all parts of the world, especially to the hotter regions, such as Mediterranean lands (more particularly Egypt and Turkey), the West Indies, South America, West and Central Africa, India, the East Indies, China, Japan, and Australia, which are our chief customers for these commodities. These cotton piece-goods were worth over £142,000,000 in 1922. If the cotton yarn, exported mainly to European countries (Germany, Holland, Turkey), British India, and Japan, and other cotton goods be added, the total cotton manufactures we export are valued at nearly £181,000,000 on the average of the three years 1921–23.

Over 60,000 square miles of woollen and worsted goods over 4,200,000 square yards of flannel, and 700,000 pairs of blankets are exported annually. The woollen trade is mainly with the cooler countries of the world, more particularly with European countries (especially

France, Belgium, and Germany), the United States and Canada, Australasia, Argentina, and Japan.

The hostile tariff of the United States has diminished the export of woollen goods to that country. Woollen and worsted tissues exported to the United States in 1896 were worth £3,500,000; in 1922, despite the post-war rise in prices, only £3,039,000. The total woollen manufactures of all kinds, including yarns, exported in 1921-23 averaged £59,000,000.

Approximately, 25 square miles of linen goods are exported, composed chiefly of white or plain linen. About 10 per cent. consists of sailcloth or canvas.

The chief markets for linen goods are the United States (which takes over half of the total), Australia, Canada, India, and Argentina. The annual value of linen goods exported averaged £11,000,000 in 1921-23.

Almost one square mile of silk manufactures are annually exported. Twist or yarn goes chiefly to the United States, France, and Holland; broadstuffs of silk or satin to France; handkerchiefs and shawls to India. The United States and our colonies receive all kinds of silk goods. The total exports are worth over £2,000,000.

Over 44 square miles of jute piece-goods are exported to the United States, Argentina, Canada, and other countries. About one-third of the jute yarn exported is sent to Brazil. Jute manufactures were exported to the average annual value of about £4,000,000 in 1921-23.

A large number of miscellaneous textile articles are exported, including cotton and linen thread for sewing purposes, lace, hosiery, carpets of wool and jute, and many others.

The total annual value of cotton, woollen, and linen textiles exported averaged over £150,000,000 in 1911–13, and nearly £350,000,000 in 1921–23.

Miscellaneous Manufactured Articles (chiefly of Home Manufacture).—A large trade is done in **chemical products** (alkalies, bleaching materials, manures, and medicines), amounting to over £14,000,000 per annum; in glass and earthenware, to about £8,000,000 per annum; and in paper and paper articles, to £7,000,000 per annum.

Rubber goods worth £5,000,000 are annually exported; leather, unwrought and wrought (boots, shoes, and saddlery, &c.), to £8,000,000 worth per annum; furniture, haberdashery, millinery, books, and many other articles are sent abroad in large quantities.

Raw Produce for Manufactures (chiefly of Foreign Origin).—In addition to coal, iron, and other ores, which have already been mentioned, a large export trade is done in textile raw materials. Of these **wool**, in all its forms, is by far the most considerable, averaging in value £35,000,000. Less than one-quarter of this represents home-grown wool. For these exports the principal customers are France, Germany, the United States, and Belgium. Imported cotton (average 1,000,000 cwt.), dressed and undressed **flax**, and **hemp** are also exported in large quantities. Rubber and gutta-percha, though not so important as in pre-war years, still figure in our entrepôt trade, averaging yearly over £6,000,000 worth in 1921–23.

Food Exports (chiefly of Home Origin).—The export of **fish**—one of the few natural products which this country exports—is very large. Over 3,000,000 cwt. of herring, worth over £3,300,000, were sent

abroad annually in 1921–23. Our largest customers for fish are those countries where the use of flesh is forbidden on religious grounds at certain seasons, such as Germany, Poland, Russia, and the Roman Catholic countries bordering the Mediterranean.

Live-stock is in considerable demand abroad, chiefly for breeding purposes. Of live-stock used for food, sheep are the most important; but the number exported is less than that of horses, which are largely exported to Belgium.

Of **vegetable** home-grown exports, the potato is the most important, the quantity exported varying from year to year with the size of the crop. In 1898 only about 194,000 cwt. were exported, and in 1922 2,910,000 cwt.

Our food exports include colonial produce of all kinds; cereals, such as maize, wheat, wheat-flour, and barley, to which may be added 124,000 cwt. of biscuits and cake, and a growing quantity of confectionery; foreign beef and pork; dairy produce and eggs. Colonial produce is the most important.

CHAPTER IX.

THE GREAT TRADE-ROUTES FROM THE BRITISH ISLES.*

FOR an island country, such as Britain, transport by sea is all-important, bringing it into contact with all the maritime countries of the world. We have seen that much of our raw material and food is imported, and that we are dependent upon foreign

* See map on page 184.

markets for the sale of our surplus manufactures. It is, therefore, important to understand the main sea-routes and the principal commodities carried over them.

The North Sea and Baltic Trade.

When population and manufactures were concentrated in the south-east of Great Britain, the greater part of our trade was with the ports on the opposite side of the English Channel and the North Sea, more particularly between the Thames and the Rhine ports. In modern times the North Sea trade is still very valuable; it is carried on from all the east coast ports, more particularly from London, Harwich, Grimsby, Hull, the north of England ports, and from those of the Forth. The **North Sea** trade may be divided into two kinds, the mainland and the Scandinavian trade. The mainland trade is with France, Belgium, Holland, and Germany; the chief ports being Dunkirk (Dunkerque) in France, Antwerp (Anvers) in Belgium, Rotterdam and Amsterdam in Holland, Bremen and Hamburg in Germany—much of whose trade also goes through Holland and Belgium. The Scandinavian trade is largely with Bergen, Kristiansund, Kristiania, and Drammen. The chief exports to the mainland are cotton and woollen yarn and manufactures, coal, metals, and machinery—the Humber ports doing the largest trade.

From Belgium we receive cotton, silk, woollen, and linen goods greater in value than our exports to these countries; also flax, glass, iron, zinc, sugar (both refined and unrefined), eggs, and dairy produce. From Holland we obtain butter, margarine, cheese, fresh and preserved meat (especially mutton), sugar, and colonial

produce, such as cacao and rice. We import much German, Czechoslovak, and Swiss produce through Holland and Belgium, notably silk, sugar, clocks and watches, glass, gloves, wine, condensed milk, toys, and aniline dyes.

To Norway the chief exports are cotton, woollen, and metal manufactures, and coal, in return for which we obtain timber, wood-pulp, paper, fish, ice, and condensed milk.

A large passenger trade is carried on from Harwich to the Hook of Holland (Hoek van Holland), Rotterdam, and Antwerp; from Queenborough to Flushing (Vlissingen); from Dover to Ostend; and in the summer months also from Tilbury to Ostend.

The Baltic trade is with regions having large areas of forest and agricultural land, but little coal or other minerals, except the iron of Sweden.

Navigation is interrupted from three to five months every winter, owing to many of the harbours being ice-bound. The waters of the Baltic are only one-quarter as salt as those of the ocean, and freeze more easily, although the whole sea is but rarely completely covered with ice. The use of ice-breaking steamers in recent years has helped to keep the Baltic navigable. Several canals unite the North and Baltic Seas. By far the most important is the internationalised Kiel Canal between Brunsbüttel, near the mouth of the Elbe, and Holtenau, near Kiel, which admits the largest vessels. This canal saves about 240 miles (twenty hours) on the journey from London to Baltic ports other than Danish, 180 miles (fifteen hours) from the Humber, and over 100 miles (nine hours) from the Tyne ports. From the Forth, the old route by

the Skager-Rak and the Kattegat is as short, but its navigation is much more dangerous. Copenhagen (Kjöbenhavn) on the Sound, is the great commercial centre of the Baltic trade. Coal, metal, and manufactured goods of all kinds are sent thither, and Danish butter, bacon, and eggs are shipped to Britain.

Coal, metals, textile fabrics, and machinery are the chief products sent to the Baltic ports, the cold climate creating a greater demand for woollen than for cotton fabrics. In return we obtain timber, wood-pulp, iron, butter, paper, and matches from Sweden through the ports of Göteborg (usually written in English, Gothenburg), Malmö, Norrköping, and Stockholm. Timber, cereals, flax, hemp, linseed, oil-seed cake, and butter are imported from Russia and the Baltic Republics through Petrograd, Riga, Revel, and Memel. From Germany, through Königsberg, Stettin (with Swinemünde as its outport), and Kiel, we get timber, butter, and some manufactured and chemical goods; but most of these pass through the North Sea ports.

The European Atlantic Trade.

A very large proportion of British trade between the British Isles and the Continent is carried on across the English Channel, between Dover and Calais, Folkestone and Boulogne, Newhaven and Dieppe, Southampton and Le Havre, Weymouth and St Malo. A large part of the trade between London and Paris is carried on by direct shipment from London to Le Havre or Rouen on the Seine, and steamers regularly ply between London and Paris. A considerable trade is also carried on between the coalfields of South Wales and the north of England

and the ports in the north of France. The latter also trade with Liverpool.

Trade with the Bay of Biscay and the coast of Portugal and Spain is actively carried on through all west coast ports, more particularly between Liverpool and Bordeaux. Bilbao, Santander, and other ports in the north of Spain send unsmelted and partially smelted ores to the South Wales and Lancashire furnaces. The clarets of Bordeaux are shipped direct to London, Leith, and Liverpool. From Oporto and Cadiz respectively come port and sherry wines; from Lisbon, olives, oranges, and other fruits; from Huelva and Cadiz, copper, manganese, and other minerals from the Sierra Morena, as well as cork, fruit, and other products of Andalusia. Coal, metals, and manufactured cottons are sent in exchange, chiefly from Liverpool, London, and the coal exporting ports of northern England and Scotland.

The Mediterranean Trade.

The Mediterranean, like the Baltic, is a sea with few coalfields near it, those of the south of France being comparatively unimportant. The forests of the Mediterranean have been nearly all cleared, so that wood is not available for fuel as in the case of the Baltic. Consequently a large trade in coal is done with the Mediterranean ports, chiefly for industry and transport, as the southern climate greatly reduces the domestic consumption.

The Mediterranean is not the seat of very great industrial activity save in the valleys of the Ebro, Rhone, and Po, and manufactured goods, more particularly cottons, linens, and light woollens, are among

the articles chiefly in demand. In exchange for these commodities, our ships bring back subtropical fruits—oranges, lemons, figs, olives, grapes, and also dates from the borders of the desert. Minerals are most largely obtained from the south of Spain and northern French Africa. A large trade in cereals passes through the Mediterranean from the Black Sea ports.

To protect our commerce in the Mediterranean and to guard the route to India, Britain possesses three stations in the Mediterranean: Gibraltar, on the Spanish mainland, in the west, guarding the strait of that name; the island of Malta, commanding the passage between Sicily and Africa; and Cyprus, protecting the eastern Mediterranean. Egypt was under British control from 1882 till 1922. Owing to the importance of the Suez Canal as an international highway, British troops are maintained for its defence.

Spanish Trade.—From Malaga, Almeria, Cartagena, and Valencia in the south of Spain, grapes, raisins, wines, oranges, lemons, almonds, and copper, mercury, and other minerals from the Sierra Morena, are sent to this country, which in return exports coal, metal goods, and textile manufactures. Barcelona, to the north of the mouth of the Ebro, is the port for the rich lands of Catalonia, carrying on a trade with Britain similar to the southern ports.

French Trade.—Cette, in the south of France, is the great wine port of the Mediterranean. Marseilles is the commercial outlet for Provence and the Rhone valley. It lies east of the Rhone delta, the shallow distributaries of that river not being navigable for large vessels. Wine and olive-oil are exported to

this country, coal and metal goods being taken in return.

Italian Trade.—Genoa (Genova), Leghorn (Livorno), and Naples (Napoli) receive large quantities of coal from South Wales, Newcastle, and Scotland; fish from Scotland and from the south-west of England; engines, railway plant, and metallic goods. Through Genoa itself we import little, our trading-vessels going farther east for their return cargo, to the Levant, to the Ægean and Black Seas, or to Algiers. The transporting of coal and other commodities from Britain is passing into the hands of Italian shippers. From Naples olive-oil, marble, wine, hides, and hemp are obtained in return. A considerable trade is done with the ports of southern Italy, more particularly with Palermo and Messina, which take cotton, woollen, and metallic manufactures, and coal, in exchange for wine, oil, southern fruits, and sulphur.

Adriatic Trade.—From Venice (Venezia), the centre of a considerable Adriatic trade, our ships bring back little, usually leaving the harbour loaded with ballast, to take in wheat, flour, and wine at the Italian ports of Trieste and Fiume, the outlets of Austria, Hungary, and Yugoslavia.

Greek Trade.—Valonia and currants are the chief exports of Patras and Piræus, which receive industrial produce in exchange. The Corinth Canal, across the isthmus of that name, saves the long journey round the south of the Morea. From Salonika (Slavonic, Saloniki; Turkish, Selanik) cereals, tobacco, wool, and opium are obtained. Syra, or Hermopolis, is the coaling station and chief port of the Grecian Archipelago, and exports emery and iron ore.

Turkish Trade.—Constantinople (Turkish, Stambul), on the Golden Horn, is one of the most important commercial cities in the world. Lying between the Black Sea and the Mediterranean, and between Europe and Asia, it is the market through which the products of two seas and two continents are exchanged. Manufactured goods of all kinds are sent out from Britain in vessels which return with Turkey carpets (made by Armenians), mohair, wool, and opium.

Smyrna, the great port of Asia Minor, receives from this country manufactured articles of all kinds—metal and textile, chemical and leather. Sultana raisins, barley, beans, figs, olive-oil, valonia, gall-apples, drugs, cotton-seeds and other seeds, and tobacco are among the most important exports.

Danube Trade.—From the Danube ports, more particularly Sulina, Galatz, and Braila (or Ibraila), the cereals of the Hungarian and Wallachian plains are shipped.

Black Sea Trade.—Cereals are the chief products obtained from Varna in Bulgaria, and Odessa, Kherson, and Taganrog, the principal ports of southern Russia. From Batum (Georgia), in the east of the Black Sea, petroleum from Baku in the eastern Caucasus (Azerbaijan) is exported. Trebizond distributes most of the imports intended for Asia Minor and Persia, and collects much Persian produce, more particularly silk and woollen, for export to this country.

Levant Trade.—Beirut (Beyrouth) and Haifa, the chief ports of Syria and Palestine respectively, send wool to America by Liverpool; but the chief trade is in fruit.

Egyptian Trade.—From Alexandria the products of Egypt—cotton, cotton-seeds, sugar, beans, onions,

cigarettes--together with gums and ivory from the Sahara and the Sudan, are shipped.

North African Trade.—Bengazi and Tripoli trade in gums and other products, brought across the desert, and, in common with Tunis, Algiers (Alger), and other ports in northern French Africa, export esparto grass (for making paper) and barley. Algiers also exports iron ore. In return we send coal, cottons, and metal goods.

Extra-European Atlantic Trade.

The Atlantic trade may be divided into the North American trade, the trade with Central America and the West Indies, the Guiana and Brazilian trade, the Plate trade, the West African trade, and the South African trade.

The North American Atlantic trade is of great importance to Britain. Not merely do we get the greater part of our food-supply from the United States and Canada, but a very large proportion of our manufactured goods are sent to these countries. The St Lawrence ports, Quebec and Montreal, are closed in winter by ice, and the traffic is then diverted to Halifax, St John, Portland (Maine), Boston, and New York. With the last two ports, together with Philadelphia and Baltimore, a very large proportion of our trade with the United States is carried on. From Halifax and St John, cereals, flour, cattle, meat, timber, cheese and other dairy produce; and from the United States ports, iron goods in addition, are sent in return for every kind of manufactured article. High tariffs and the steady development of American industries are tending to reduce the importance of our exports to

the United States, while the preferential tariff granted by Canada to the mother-country serves to foster our trade with that Dominion. Wilmington, Charleston, and Savannah send us sea-island cotton, as well as pitch-pine, turpentine, and resins from the forests of the southern Appalachians. Pensacola, Mobile, New Orleans, and Galveston are the chief ports on the Gulf of Mexico, from which we obtain raw cotton, cotton seeds and oil, tobacco, maize, wheat and meal, sent down the Mississippi to New Orleans.

Central American Trade.—Manufactured goods are the chief exports to Vera Cruz, the principal port of Mexico, from which petroleum, metals (more particularly silver), mahogany, and cigars are brought. Belize, in British Honduras, and Bluefields, in Nicaragua, export mahogany and other fine woods from the wet and densely-forested eastern regions of Central America; but most of the trade of this region is carried on from the Pacific ports which are on the side of the isthmus best situated for agriculture and trade. The opening of the Panamá Canal in 1914 has brought these ports much nearer Britain.

West Indian Trade.—The West Indies exchange sugar and tropical fruits for manufactured goods of all kinds. From Havana, in Cuba, we get tobacco and cigars; sugar, molasses, and rum from Kingstown in Jamaica; cacao from Port of Spain, which also exports the asphalt of the Trinidad pitch lake. Barbadoes is the British shipping centre for the Lesser Antilles.

The Guiana and Brazil Trades.—From La Guaira, the port of Caracas, the capital of Venezuela, and the other ports in the north of South America cacao is the chief export. Sugar is principally brought from George-

town, on the Demerara River in British Guiana. Cacao is also shipped from the north of Brazil; but the chief trade of that district is in rubber, which is shipped from Pará, at the mouth of the Amazon. It is also shipped from Manaos (situated on the Rio Negro above its junction with the Amazon), Pernambuco, and Bahia, the latter the second port in Brazil. These ports also send coffee, sugar, cotton, rosewood, hides, and diamonds. The great centre of Brazilian trade is Rio de Janeiro, from which all these articles are exported. Santos, farther south, is the outlet for the rich coffee district of São Paulo.

The Plate Trade.—Buenos Aires and Montevideo are the chief ports on the Plate estuary, from which wheat, maize, and other cereals, cattle, sheep, wool, and hides from the Plate basin, are exported in return for coal, chemicals, textile and metal goods.

The West African Trade is almost entirely in cotton and metal goods and spirits, the latter usually of the vilest description. These are sent to Freetown, Accra, Lagos, Akassa, Bonny, and other ports on the Gulf of Guinea, from which cacao, rubber, palm-oil, oil-yielding nuts, and ivory are exported. The opening of railways is facilitating trade, and hopes are entertained that much raw cotton may be obtained from this region.

To **South Africa** we send out clothing of all kinds, metal goods, machinery, leather, cotton and woollen goods, paper and stationery, furniture, carriages, and in fact all manufactured articles required either for domestic or industrial purposes. In return we obtain diamonds, gold, copper, wool (both of the sheep and the angora goat), fruit, hides, and ostrich feathers. Capetown, Port Elizabeth on Algoa Bay, East London,

Durban on Port Natal, and Lourenço Marques on Delagoa Bay are the chief ports for the trade of South Africa.

Indian Ocean Trade.

The trade of the Indian Ocean was formerly carried on round the Cape of Good Hope; but since the opening of the Suez Canal the shorter route is generally taken by steamers. The trade carried on across the Indian Ocean may be divided into East African, Arabian, Persian, and the Indian and Ceylon trade.

The **East African trade** is still carried on by both routes. The principal southern ports have been already dealt with. Zanzibar is the great trade-centre of East Africa. From the island itself the chief export is cloves; but much of the ivory and rubber brought from the interior to Vitu, Mombasa, and Dar-es-Salaam is sent to Zanzibar; Mombasa is connected by railway with the Victoria Nyanza, Dar-es-Salaam with Lake Tanganyika. Trade is carried on at the mouth of the Zambezi with the Shiré Highlands, part of the British Nyasaland Protectorate, where coffee was the first cultivated product introduced by settlers, and rice, tobacco, cotton, and tea are successfully grown. Trade with Madagascar has diminished since the island became a French possession. From Mauritius and other islands sugar is the chief export.

The **Arabian Trade** is mainly in gums. These are exported through Jidda and Aden (the latter a British possession guarding the entrance to the Red Sea). Wool, carpets, hides, dates, shells, opium, and gums are among the chief articles exported from the **Persian Gulf**, mainly through Bushire, on the coast, and Basra,

in Mesopotamia. Dates, gums, and a small quantity of goats' and camels' hair come from the Arabian steppes through Persian Gulf ports.

Indian and Ceylon Trade.—India is a very important market for our manufactures, sending us in return both raw materials and manufactured articles of every kind.

Karachi, the port of the Indus, exports wheat, oil-seeds, wool, cotton, and hides; and imports large quantities of railway plant for the rapidly increasing network of lines.

Cotton and cotton yarn, oil and oil-seeds, wheat and other cereals, opium, leather, gums, and tea are sent to this country from Bombay. In return it takes chiefly cotton goods and machinery, railway plant, metal goods of every kind, and manufactured articles for distribution to western and central India.

From Colombo, in Ceylon, are brought all kinds of tropical products, more particularly tea, cacao, rubber, quinine, spices such as cinnamon, coco-nuts and copra, areca-nut, tobacco, and vegetable ivory. The export of coffee, formerly very important, has declined owing to the destruction of the plants by disease.

Madras does a large export trade in raw cotton, coffee, oil-seeds, leather, Palmyra palm sugar for brewing and for fattening cattle, oil, coco-nuts, copra, tobacco, and hides, especially goatskins.

Much of our Indian trade passes through Calcutta. Jute is exported to Dundee both from this port and from Chittagong, but large quantities are retained for local factories. Tea, rice, wheat, opium, some rubber, raw hides of cattle and goats, gunny sacks, and linseed are other important articles brought from Calcutta to this country.

Rangoon distributes the produce of Burma, including rice (which is by far the most important), petroleum, cutch, teak, and precious stones, such as the ruby.

Pacific Trade.

There are four routes from the British Isles to the Pacific Ocean: by the Suez Canal and the Indian Ocean, by the Cape of Good Hope and the Indian Ocean, by the Panamá Canal, and by Cape Horn. The Panamá Canal and the railway across the isthmus of Tehuantepec greatly shorten the distance to many Pacific ports, more particularly to those on the west coast of America. It has also been proposed to avoid the long journey round the south of the Malay Peninsula by cutting a canal across the isthmus of Kra.

The Pacific trade may be divided into the East Indian trade, the China and Japan trade, the North American trade, the tropical American trade, the South American trade, and the Australian trade.

The East Indian trade resembles the West Indian in many respects. The intertropical islands of eastern Asia are rich in forest products, yielding fancy timbers and dye-woods, juices such as gutta-percha, and fibres such as Manila hemp. Tin, spices, sago, sugar, gutta-percha, rubber, cutch, gambier, and fruits are exchanged for cotton goods and hardware.

Singapore, on an island of the same name at the southern end of the Malay Peninsula, is the natural centre for the western ports of the East Indies, and a port of call for ships passing through the Strait of Malacca. Local trade is mainly in the tin of the Malay Peninsula; but all East Indian products are brought to Singapore for transhipment.

Batavia, on the island of Java, occupies a similar position with regard to the southern part of the group in the Sunda Strait. It is the capital of the Dutch East Indies, the rich produce of which is brought to Batavia for shipment to Europe. Amboina, in the Moluccas, is the centre of the spice islands.

Manila, on Luzon, the largest of the Philippines, is the northern centre of the East Indies. Under United States control it is growing rapidly in commercial importance. Ships sailing to the China Sea can seek the shelter of Luzon during the North-east Trades, and it also lies on the direct route between Hong-kong and Australia. Sugar, cheroots, and Manila hemp are the chief articles exported from the Philippines, in addition to ordinary East India produce; but the resources of these valuable islands are still practically undeveloped.

From Bangkok in Siam ships bring back teak, rice, and tin.

China and Japan Trade.—The populous countries of eastern Asia are excellent customers, taking more particularly large quantities of cotton goods and hardware.

The trade of China is developing considerably with the opening up of the country by railways and the use of steamers on the Yang-tse-kiang and other navigable waterways. China is not merely a customer for the cottons and hardware which form the bulk of the trade at present, but a great importing centre for railway plant, machinery, and metal manufactures of all kinds, to be utilised in the building of new railways and factories.

Hong-kong. a British island at the mouth of the

Si-kiang, in close communication with Canton, the great southern port of China, is the outlet through which about 45 per cent. of the foreign trade of China is carried on. From Hong-kong and Canton the tea and silks of southern China are largely exported.

There are many ports on the rocky eastern coast of China south of the Yang-tse-kiang, such as Amoy, Fuchow, and Hangchow; but the bulk of the trade of central China passes through the port of Shanghai, near the mouth of that river. Shanghai is the great importing centre of central China, and does a large export trade in tea and silk.

There are several ports on the Yang-tse-kiang, of which Hankow (= Hanmouth), at the mouth of the Han River, a tributary of the Yang-tse-kiang, is the most important, although river steamers proceed as high as Ichang, one thousand miles from the sea.

The trade of northern China passes mainly through the port of Tientsin, on the Gulf of Pechili; that of Manchuria through Niuchwang, on the Liautung Gulf, or the (Japanese) port of Dairen. These gulfs are frozen in winter; but during the other months a vigorous trade goes on, more particularly from Tientsin, which is the port of Peking, the capital. Exports from Manchuria include soya beans, oil, and cake, wheat, and timber.

Silk manufactures and straw plait are our chief imports from Japanese ports. Copper, rice, carpets, lacquer ware, china, and beautiful fabrics are among the other goods exchanged for the cottons, woollens, metals, machinery, steamships, engines, and implements of all kinds sent from this country. The chief ports

are Yokohama, the port of the capital, Tokyo, on the main island, Honshiu or Nippon, Kobe, on the Inland Sea, and Nagasaki, on the island of Kiushiu.

North American Pacific Trade.—From Vancouver, Prince Rupert and the towns of the Canadian railways, and Victoria, on Vancouver Island, passengers and mails are conveyed to and from the Asiatic Far East, Australia, and New Zealand. The amount of direct oceanic communication with the British Isles, *via* Panamá, is increasing. Manufactured articles are carried out in vessels which bring back timber from British Columbia, Tacoma, and Seattle, on Puget Sound, and Portland (Oregon), from which, as well as from British Columbia, canned salmon is largely obtained. These are also grain ports; but most of the wheat raised in western America is exported through San Francisco, which also exports oil and metals. In recent years the fruits, wines, fish, fresh and dried meat of the rich Californian valley have been largely exported from San Francisco, and from Los Angeles in the south, to which ports clothing, metallic and textile goods, and sacks to hold grain are consigned from this country.

Tropical American Pacific Trade.—Coffee and cacao are the most important exports from the Pacific ports in tropical America. Coffee is brought from Punta-arenas, in Costa Rica. Guayaquil, the port of Ecuador, exports cacao and straw (Panamá) hats.

South American Pacific Trade.—The dry regions of Peru and Bolivia furnish guano; sugar and cotton (under irrigation); cinchona (quinine), rubber, and vanilla from the wetter eastern sides; while alpaca wool and silver come from the mountains. The chief harbours for imports are Callao, close to Lima (the

capital), and Mollendo, from both of which railways ascend the Andes. Antofagasta, the chief port of northern Chile, is connected with the plateau of Bolivia by a railway, which brings down silver, copper, tin, cinchona, and other products of that country, as well as nitrate of soda from the Atacama desert, across which it passes.

Valparaiso, the port of Santiago (the capital), is the chief harbour of Chile. Cotton, mixed cotton and woollen goods, iron, ironware, and machinery are the chief articles taken out by our ships in exchange for the wheat, copper, wool, and guano shipped at Chilean and Peruvian ports.

Australian Trade.—Australia is reached from Britain both by the Suez Canal and by the Cape. Mails and passengers from this country can also proceed to Australia and New Zealand by the Transatlantic lines to eastern America, by rail to the Pacific coast, and thence by steamer across the Pacific, or direct by the Panamá Canal. The exports from this country are chiefly manufactured goods, which are exchanged for wool, wheat and flour, flesh, hides, fruits, butter, tallow, leather, gold, copper, and lead.

Fremantle, at the mouth of the Swan River, **Western Australia**, is the first port touched by vessels from western Europe, and here West Australian gold, wool, wheat, and hardwood timber are shipped. Fremantle is the port of Perth (the capital); and Albany, on King George Sound, which is joined to Perth by railway, is the southern port.

Port Adelaide, which is both a port and a suburb of Adelaide, the capital of **South Australia**, is the next port touched at. Here wool, lead, copper, gold, silver,

wine, and wheat are shipped in return for textiles, cotton and woollen clothing, shoes, iron, railway plant, hardware, tobacco, beer, and spirits.

Melbourne, on Port Phillip, is the chief town of Victoria. The goods imported from Britain are the same as in the case of Adelaide, but on a larger scale. Wool, butter, gold, and cereals are the most important articles we take in return; but tallow and unworked leather are of considerable importance. Frozen and preserved meats and fruits are also sent to Britain.

Sydney, on Port Jackson, the capital of New South Wales, does a very large trade. Silver, wool, and dairy produce are more, gold less, important than in the case of Victoria, and a considerable quantity of meat, leather, tallow, hides, copper, and lead is exported.

In Queensland there are several ports to which we ship the same commodities as to the other Australian ports. The cargoes brought back differ considerably. Brisbane, in the south, is the capital, and the most important port. Here wool, hides, tallow, flesh, and preserved meat are still among the principal exports. Gold and pearl shell are also important. From Rockhampton, Townsville, and Cairns, railways run far into the interior. Townsville receives much gold from the Charters Towers mines. Wool becomes less important in the far north, tropical products taking its place.

Tasmania (capital, Hobart) has a large wool trade, and Tasmanian fruits, more particularly apples, are well known in British markets.

New Zealand.—Auckland and Wellington are the

busiest ports in North Island ; Lyttelton and Dunedin in South Island. Frozen mutton, dairy produce, wool, tallow, sheepskins, and Kauri gum are the chief exports. Kauri gum is obtained principally from North Island. The sheep of the Canterbury Downs in the South Island yield exceptionally fine mutton. Leather is also exported, as well as gold, silver, and fruit.

CHAPTER X.

THE TRADE OF THE UNITED KINGDOM.

THE trade of the British Isles has passed through three stages. In the first, or primitive stage, which is of great antiquity, minerals, more particularly the tin of Cornwall, attracted traders from the Mediterranean. In the second, or mediæval stage, organic raw products, more particularly wool and hides, were exchanged for manufactured goods and articles of luxury. In the third, or modern stage, the process is to a large extent reversed, and manufactured goods have become the commodities chiefly offered in exchange for food, raw materials, and luxuries.

The trade of the United Kingdom has trebled itself during the last forty years. During the five years 1855-59 the average annual value of the imports was £169,000,000, and of the exports £116,000,000—making an average total trade of £285,000,000. Fifty years later, during the three years 1911-13, the average annual value of imports was £731,000,000, and of the exports £597,000,000—making an average total trade of £1,328,000,000, or, approximately,

five times as much as between 1855 and 1859. In 1922 the average annual value of imports was over £1,004,000,000, and of exports of all kinds £824,000,000, a total trade of £1,828,000,000. About one-eighth of the exports are of foreign and colonial origin. This trans-shipment trade has long been an important feature of our commerce, especially of London. Over 90 per cent. of this trade is English, and 8 per cent. Scottish.

In the imports the increase has been general. In the exports an increase has taken place in the case of most commodities, more particularly under the heads of machinery, textile fabrics, metals, and raw materials, more especially coal.

The tonnage of trading vessels engaged in foreign trade which entered the ports of the United Kingdom in 1922 amounted to nearly forty-five million tons, and sixty million tons of shipping left its ports during the same period. This is a decrease since 1913 of five million tons in the tonnage of vessels entering British ports, and of eight million tons in that of vessels leaving them—a result of the Great War's ravages. The coastal trade is over forty million tons entered, and as much cleared.

Over one-fourth of the imports come from British possessions, and one-third of the exports are sent to them. By far the most important part of our import trade is with the United States, amounting to over one-fifth of the whole. In 1922 about 6·5 per cent. of our imports come from Australia; 5½ per cent. from the Argentine Republic and Canada respectively; 5 per cent. from France; 4½ per cent. from India and New Zealand; 4 per cent. from Denmark;

and about 3 per cent. from the Netherlands,* Egypt, Germany, and Belgium respectively.

In the same year (1922) British India took over 12 per cent. of our exports of all kinds, a larger proportion than any other country. The United States took over 9 per cent.; France and Australia over 8 per cent. each; Germany nearly 6 per cent.; the Netherlands 5 per cent.; Belgium nearly 4½ per cent.; Canada, the Argentine Republic, the Union of South Africa, Japan, and China each took over 3 per cent.

It will thus be seen that our largest trade is with the United States, which is not only one of our best customers, but is also the source from which we derive a considerable share of our food-stuffs and raw materials, including a large proportion of the wheat we consume and most of the cotton we manufacture. Yet we import five times as much from it as we export to it. Next comes British India, to which we send manufactured cotton, and from which we obtain wheat, raw cotton, and many other natural products. Our pre-war trade with Continental countries was in the following order: Germany, France, Russia, the Netherlands, Belgium. Our exports to them in the five years 1908–13 increased more rapidly than our imports from them.

About one-eighth of the trade of the United Kingdom is an entrepôt trade—that is, a trade in commodities imported for re-exportation. There is too little trade between many foreign countries to permit of a direct exchange of commodities between them. In such cases it is generally cheaper to use London as an

* It must be noted that the trade of Central Europe passing through Belgium and Dutch ports is reckoned as trade with Belgium and the Netherlands.

entrepôt to which cargoes from various countries are consigned in vessels which reload in London with suitable cargoes.

Commercial Advantages and Disadvantages of the British Isles.—It has already been pointed out that the distribution of high and low land in the British Isles makes communication easy, except in the Highlands of Scotland. The productive centres are either near the coast or connected with it by navigable rivers whose great tidal estuaries admit ships of large tonnage to safe harbours. On the west coast of Great Britain, where most of the rivers are shorter, good natural harbours are numerous. Coastal navigation can be carried on uninterruptedly at all seasons. The British Isles are favourably situated for foreign trade. They lie facing two of the wealthiest continents, Europe and North America, and almost in the centre of the land hemisphere.

The climate is everywhere equable, permitting work to be carried on all the year through. The humidity is sufficiently varied to permit of every kind of pastoral and agricultural occupation, as well as the most delicate textile operations, being successfully carried on.

The abundance of coal and iron has contributed to the pre-eminence of the United Kingdom in the modern industrial world. These minerals occur together near lime and clay, affording great advantages for iron manufacture. Shipbuilding naturally developed in the iron centres near the coast, and the British are still the greatest ocean carriers.

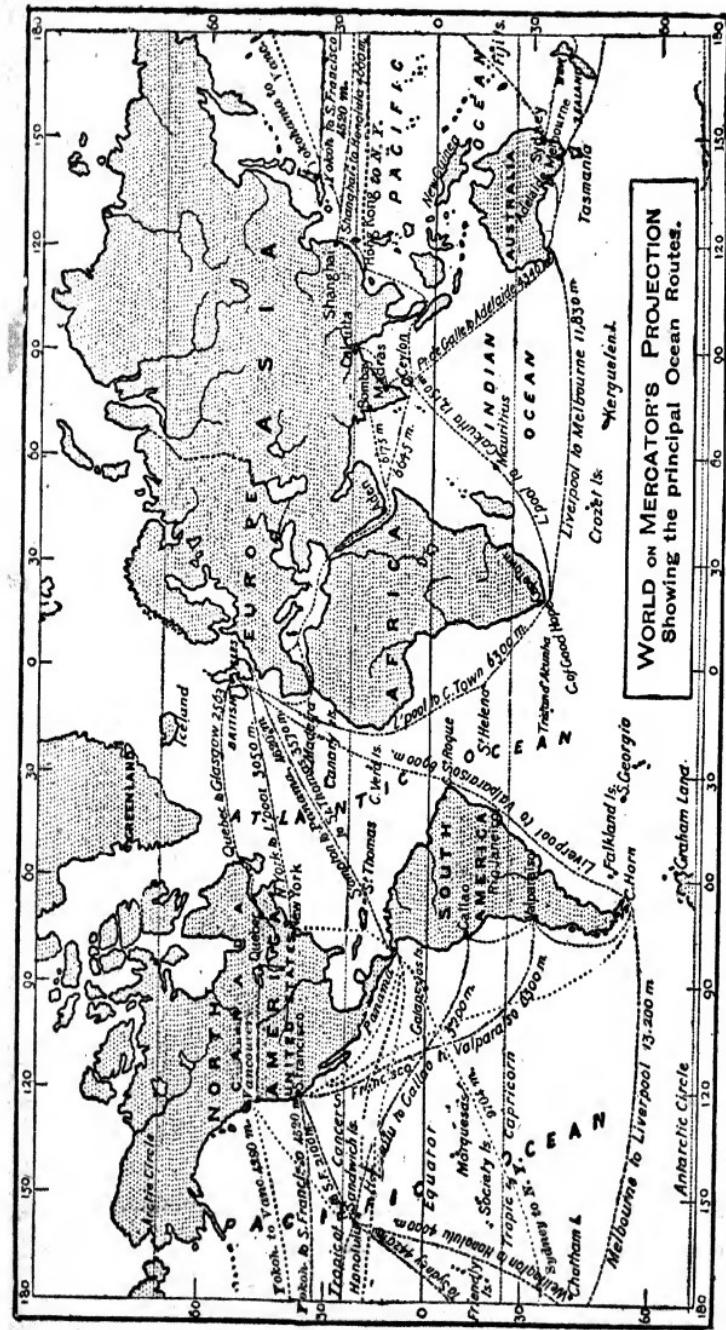
Besides these natural advantages, Britain has until recently spent little money in war for

many decades, nor are its working-men obliged to render compulsory military service, and thus, from an industrial point of view, waste three of their best years. Free-trade admits cheap food and raw materials from all parts of the world, and, before other nations began to compete, led to rapid industrial expansion. Home agriculture, however, was less favourably affected, and, owing to foreign competition, is not so flourishing as it should be.

Among the hindrances to our prosperity are heavy rents for land, high royalties on mines, and high transport rates, all adding to the cost of commodities. Still more serious drawbacks are our present educational system, which permits children to leave school too early, and a widely diffused indifference to education among the classes most in need of it. Agricultural depression, it has been said, is partly mental depression; and this is true of more than agriculture.

Much more might be made of our present resources. The problem of inland waterways must be seriously faced. Navigable rivers and canals all require to be widened and deepened. Water-power resources estimated at 900,000 b.h.p. are available for industrial purposes, while tides, and in many places winds, could also be subjugated to our needs.

Most extravagant of all is the incalculable waste of human capacity, which can only be remedied by a training which develops to the full the diverse capabilities of each individual, and inculcates in him an intelligent and sympathetic appreciation of the importance and utility of his work.



Liverpool to Buenos Aires, 6059 miles.
Vancouver to London (*via* Panama), 8810 miles
Hong-kong to London (*via* Suez), 9688 miles.

San Francisco to New York (*via* Cape Horn), 13,107 miles

San Francisco to New York (*via* Panama) 5289 miles

APPENDIX.

STATISTICAL TABLES.

Note.—In some of the tables, figures are given for the year 1913 to allow of comparison with industry and commerce under normal pre-war conditions.

STATISTICS OF CROPS AND LIVE-STOCK, 1922.

	England. 1000 ac.	Wales. 1000 ac.	Scotland. 1000 ac.	Northern Ireland. 1000 ac.	Irish Free State. 1000 ac.
TOTAL AREA OF LAND					
AND WATER . . .	32,564	4,778	19,462	3,352*	17,019*
TOTAL ACREAGE UNDER					
CROPS AND GRASS . . .	23,422	2,604	4,725	2,526	12,181
CORN CROPS—					
Wheat . . .	1,931	36	65	6	34
Barley . . .	1,303	61	157	3	168
Oats . . .	1,961	203	988	400	814
Rye . . .	84	0·6	7	1	6
Peas and Beans . . .	444	2	4	1	0·4
Total Corn Crops	5,723	302·6	1,221	411	1,022·4
GREEN CROPS—					
Potatoes . . .	536	25	157	169	401
Turnips and Swedes	775	46	404	49	199
Mangolds . . .	411	12	2	2	82
CLOVER, SAINFOIN, AND					
ROTATION GRASSES . . .	1,999	303	1,511	482	2,063
PERMANENT PASTURE					
16,130	3,367	1,387	—	—	—
Hops	26	—	—	—	—
Small Fruit	74	1	7	10	11
	No. (1000).	No. (1000).	No. (1000).	No. (1000).	No. (1000).
Horses	1,181	160	212	115	429
Cattle	4,971	752	1,147	830	4,326
Sheep	10,172	3,266	6,684	499	3,067
Pigs	2,115	184	151	117	919

* Exclusive of water.

† Figures not available.

FISHERIES, ANNUAL YIELD, 1913 AND 1922.*

	1913.		1922.	
	1000 tons.	£1000.	1000 tons.	£1000.
England and Wales .	808	10,009	608	13,818
Scotland . . .	363	3,723	279	3,960
Ireland . . .	34	295	15	230
Total . . .	1,205	14,027	902	18,008
Including shellfish .	—	14,491	—	18,616

N.B.—Salmon are not included in this return.

METALS EXTRACTED, 1922.

METALLIC MINERALS.	Minerals raised.	Values.	Metals contained in the ores.	Values of Metals.
	1000 tons.	£1000.	1000 tons.	£1000.
Iron ore and pyrites .	6,873	2,394	2,129	13,953
Tin ore (dressed) .	0·7	50	0·4	59
Lead ore . . .	11	151	8	200
Zinc ore . . .	2	6	0·6	17
Copper ore . . .	—	—	0·1	7
Total value of all metals from British ores .				£14,241,156.

NON-METALLIC MINERALS EXTRACTED, 1922.

MINERALS.	1000 tons.	Values £1000.	MINERALS.	1000 tons.	Values £1000.
Coal . . .	249,607	219,998	Gravel, sand	2,059	337
China-clay .	667	1,067	Gypsum .	257	253
Igneous rocks	5,928	2,825	Barium (com-		
Limestone .	9,425	2,532	pounds) .	41	108
Sandstone .	2,140	1,273	Arsenic and		
Slate . . .	231	1,855	ars. pyrites	1	36
Oil-shale .	2,604	1,047	Ochre, &c. .	9	—
Salt . . .	1,871	1,595	Fireclay .	1,824	705
Chalk . . .	3,024	295	Total † . . .		£237,814

* From *Statesman's Year-Book*.

† Including other minerals not specified.

COAL PRODUCTION, 1913 AND 1922.*

DISTRICT.	1913. 1000 tons of coal.	1922. 1000 tons of coal.	DISTRICT.	1913. 1000 tons of coal.	1922. 1000 tons of coal.
ENGLAND—					
Durham . . .	41,533	34,863	England (<i>cont.</i>)—		
Yorkshire . . .	43,680	42,119	Other districts . . .	15,324	13,784
Lancashire . . .	24,321	17,540	WALES—		
Staffordshire . . .	14,351	11,670	Glamorgan . . .	38,033	32,858
Derbyshire . . .	18,133	15,263	Other districts . . .	6,929	5,909
Northumberland . . .	14,819	13,205	SCOTLAND—		
Monmouthshire . . .	15,374	14,321	Lanarkshire . . .	17,486	13,636
Nottinghamshire . . .	12,394	12,627	Other districts . . .	24,970	21,811
			IRELAND . . .		
				83	89†

Total (tons), United Kingdom (1913), 287,430,473; (1922), 249,606,864.

PRINCIPAL ARTICLES OF IMPORT.

VALUE, 1922.

	£1000.	£1000.	
Grain and flour . . .	103,332	Eggs, in shell . . .	11,302
Cotton, raw . . .	87,320	Petroleum . . .	39,135
Meat, including animals for food . . .	104,897	Cheese . . .	12,438
Wool (sheep and lambs') .	58,851	Tobacco . . .	18,614
Wood and timber . . .	37,321	Wine . . .	5,632
Sugar, raw and refined .	33,425	Metals—	
Butter and margarine .	41,186	Copper (manufactured in whole or part) .	4,847
Rubber . . .	7,295	Iron ore . . .	4,284
Fruits . . .	28,289	Iron and steel and manufactures . . .	10,419
Silk manufactures . . .	21,331	Machinery . . .	8,170
Leather and manufactures .	11,274	Motor-cars and parts .	5,927
Hides and skins . . .	14,937	Lead (manufactured in whole or part) .	4,347
Tea . . .	25,988	Tin (manufactured in whole or part) .	3,877
Chemicals, dye-stuffs, &c. .	11,379		
Oil-seeds . . .	21,298		
Woollen manufactures and yarn . . .	9,308		

* From *Statesman's Year-Book*.

† 1921.

PRINCIPAL ARTICLES OF EXPORT (HOME PRODUCE).
VALUE, 1922.

	£1000.		£1000.
Cotton manufactures . .	160,446	Metals—	
" yarn . . .	26,475	Iron, pig and puddled	3,257
	<hr/>	" tinned plates and	
Total of cotton (in-		sheets . .	9,693
cluding items not		" galvanised . .	10,049
detailed) . . .	186,920		<hr/>
Woollen manufactures .	25,057	Total iron and steel	
" and worsted		(including items	
yarn . . .	11,408	not detailed) . .	60,862
	<hr/>	Hardware, cutlery, &c.	6,426
Total of woollen and		Machinery . . .	51,539
worsted (including		Coals, cinders, fuels, &c.	77,734
items not detailed) .	58,478	Chemicals, dyes, colours,	
Linen manufactures .	11,579	&c. . . .	20,269
Apparel and haberdashery	23,368	Vehicles (including loco-	
New ships . . .	29,986	motives and aircraft) .	19,518

TOTAL TONNAGE ENTERED AND CLEARED BY PORTS,
EXCLUDING THOSE COASTWISE, 1913 AND 1920.

	1918. 1000 tons.	1920. 1000 tons.	1918. 1000 tons.	1920. 1000 tons.
London . . .	25,129	21,601	Dover . . .	4,825
Liverpool (with			Middlesbrough .	4,493
Birkenhead) .	23,263	18,033	Blyth . . .	3,718
Cardiff . . .	18,065	11,172	Sunderland . .	3,601
Tyne ports . .	15,716	10,211	Manchester . .	3,363
Southampton . .	13,326	7,643	Leith . . .	3,127
Hull . . .	9,056	5,560	Bristol . . .	2,663
Glasgow . . .	7,905	5,776	Grangemouth . .	2,149
Plymouth . . .	7,558	4,968	Methil . . .	2,092
Cork . . .	7,454	1,592	Hartlepool . .	1,949
Grimsby . . .	5,254	1,730	Harwich . .	1,908
Newport . . .	4,904	3,762	Goole . . .	1,527
Swansea . . .	4,902	3,292	Burntisland . .	1,445

TRADE OF THE UNITED KINGDOM WITH DIFFERENT
COUNTRIES IN 1913 AND 1922.*

COUNTRIES.	Imports of Merchandise from		Exports of Produce and Manufactures of United Kingdom to	
	1913. £1000.	1922. £1000.	1913. £1000.	1922. £1000.
BRITISH POSSESSIONS.				
Aden	309	331	483	500
Australia	38,065	64,863	34,471	60,457
British Guiana	648	851	730	944
British West Indies	2,116	4,437	2,339	3,462
Canada	30,488	54,895	23,795	25,271
Ceylon	7,797	10,322	4,185	3,581
Channel Islands	1,984	3,617	1,351	2,862
Cyprus	139	169	147	373
Federated Malay States	3,574	2,323	1,339	877
Hong-kong	675	666	4,354	6,260
India	48,420	47,681	70,273	91,621
Malta	31	85	1,105	1,379
Mauritius	293	3,908	536	972
Newfoundland	974	1,938	881	520
New Zealand	20,338	43,522	10,838	15,868
South and East Africa †	13,553	19,479	24,429	28,063
Straits Settlements	15,800	7,961	5,836	6,644
West Africa	5,174	9,760	7,604	11,649
Total, British Possessions (in- cluding those not detailed)	191,516	318,031	195,312	285,781

FOREIGN COUNTRIES.				
Belgium	23,382	23,657	13,240	24,831
Bulgaria	41	50	472	849
Czechoslovakia	—	5,226	—	744
Denmark	23,831	40,310	5,792	12,452
Finland	—	10,435	—	2,770
France	46,353	48,620	28,933	48,310
Germany	80,411	26,524	40,677	32,076
Greece	2,227	4,281	2,594	3,816
Holland	23,578	34,198	15,429	34,903
Italy	8,127	11,282	14,610	19,257
Norway	7,437	10,566	6,147	11,589

* From *Statesman's Year-Book*.

† Exclusive of about £10,000,000 worth of diamonds from the Cape Province.

COUNTRIES,	Imports of Merchandise from		Exports of Produce and Manufactures of United Kingdom to	
	1913. £1000.	1922. £1000.	1913. £1000.	1922. £1000.
FOREIGN COUNTRIES (continued).				
Portugal	3,017	4,589	3,271	4,219
Romania	2,037	1,695	1,947	2,636
Russia	40,271	8,176	18,103	3,679
Spain	14,394	18,733	7,852	11,990
Sweden	14,213	19,201	8,220	12,292
Switzerland	11,070	21,707	4,212	9,810
Turkey	5,416	3,907	7,706	4,627
China	4,672	9,723	14,845	23,734
French Indo-China	277	164	159	242
Japan	4,389	8,440	14,780	24,055
Java	2,086	6,962	5,701	7,772
Persia	430	8,124	725	1,703
Philippine Islands	2,183	1,644	983	623
Siam	516	299	1,352	2,236
Algeria	1,312	1,659	1,341	1,851
Canary Islands	1,549	4,348	1,671	1,886
Egypt	21,395	31,106	9,806	15,562
Madagascar	222	414	79	125
Morocco	408	546	1,277	2,343
Tunis	862	655	476	663
Cuba	3,675	10,610	2,214	1,388
Hayti	116	214	167	189
Mexico	1,880	8,604	2,233	2,213
United States	141,652	222,013	29,295	52,022
Central America	2,066	2,568	1,735	1,412
Argentina	42,485	56,520	22,641	22,708
Bolivia	2,250	1,717	360	409
Brazil	10,008	7,726	12,465	10,983
Chile	5,359	4,422	6,011	5,437
Colombia	1,089	1,980	1,693	2,268
Ecuador	468	242	415	616
Peru	3,178	7,410	1,488	1,749
Venezuela	560	239	826	950
Uruguay	2,749	4,748	2,916	2,545
Total, Foreign Countries (including those not detailed)	577,219	685,887	329,942	434,716
Grand Total	768,735	1,003,918	525,254	720,496

COMPARATIVE PRICES OF COMMODITIES.*

COMMODITIES.	1913. Mean, circa.	1923. Mean, circa.
FOOD PRODUCTS—		
Wheat, N. Manitoba No. 1, per qr.	£ s. d.	£ s. d.
British "	1 18 10	2 9 0
" " " " "	1 12 1	2 3 9½
Barley, " "	1 8 1	1 16 4
Oats, " "	0 19 11	1 7 5
Flour, Town Household . per 280 lb.	1 9 6½	1 18 4½
Beef, inferior . . . per 8 lb.	0 3 2	} 0 6 11½†
" prime "	0 5 4	
Mutton, prime "	0 6 4½	0 10 9†
Potatoes, Good English . per ton	4 6 4	4 17 1
Rice, Rangoon . . . per cwt.	0 8 7½	0 13 9½
FOR DRINKING, LIGHTING, &c.—		
Sugar, Beet . . . per cwt.	0 9 6	1 2 9
" West Indian Syrups " .	0 13 9½	2 18 10½
Tea, Congou, common . per lb.	0 0 5	0 1 5
Coffee, Santos . . . per cwt.	3 2 5½	4 1 1½
Petroleum . . . per 8 lb.	0 0 8½	0 0 11½
Tallow, Town . . . per cwt.	1 14 4	1 16 3
TEXTILE MATERIALS—		
Cotton, Raw, Middling		
American . . . per lb.	0 0 6·88	0 1 4·35
Yarn, 40's Weft . . . "	0 0 10·1½	0 1 10·65
Wool, South Down Hogs . . "	0 1 3½	0 2 1½
" Victorian, scoured		
good "	0 1 11	0 4 6½
Silk, Blue Elephant . . . "	0 10 9½	1 15 7
Flax, Riga ZK . . . per ton	36 0 9	82 9 2
Hemp, Manila "	32 10 9	33 0 5
Jute, Native Firsts . . . "	28 3 6	26 16 3
MINERALS—		
Iron, Cleveland No. 3 . per ton	3 2 6	5 9 0
" Cleveland Bars . . . "	8 12 0	11 18 4
" Steel Rails . . . "	6 14 0	9 15 0
Coals, Best Steam, New-		
castle "	0 15 0	1 12 2½
Copper, Standard . . . "	70 13 0	65 11 3
Tin, Standard "	212 14 0	204 7 6
Lead, English Pig . . . "	19 5 0	28 12 6

* Calculated for the years 1913 and 1923 from the lists published by the *Economist*. The teacher is recommended to buy a mid-month issue, when it contains a supplement giving monthly trade returns as well as prices.

† Mean of middling and prime.

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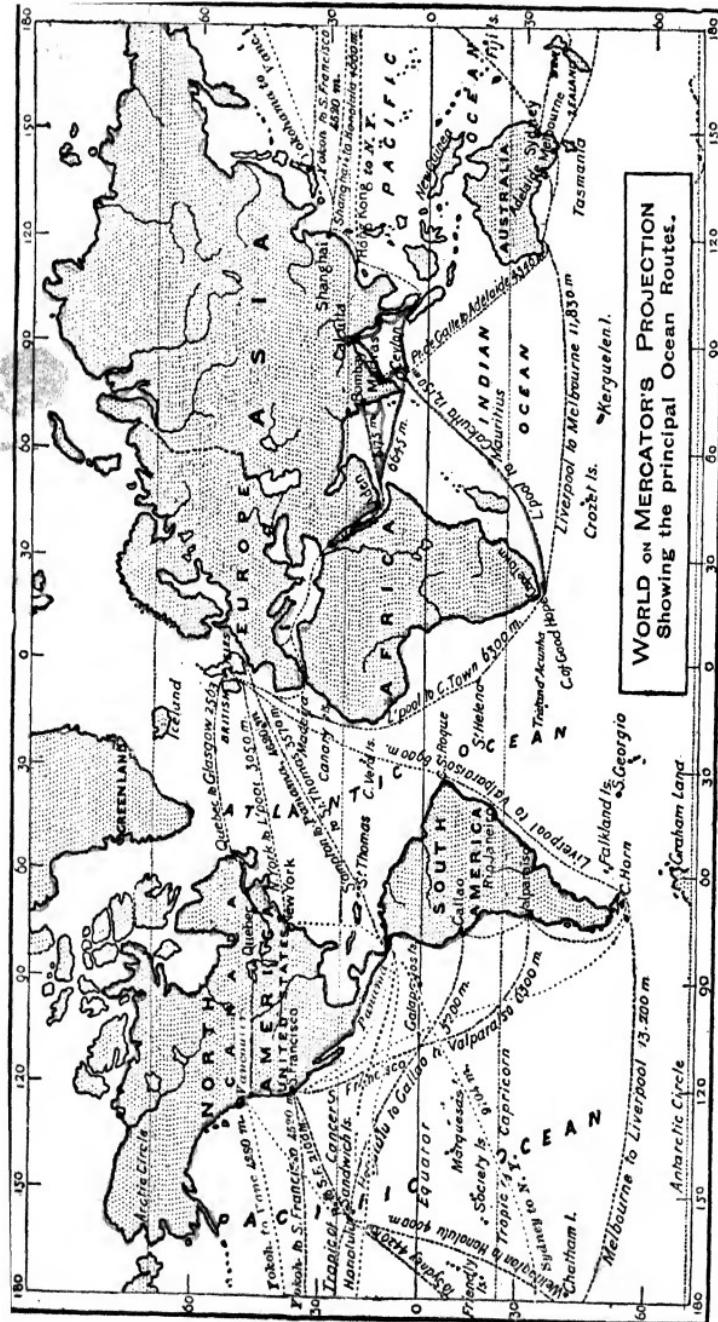
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CHAMBERS'S COMMERCIAL HANDBOOKS

COMMERCIAL GEOGRAPHY OF THE WORLD

PART II—OUTSIDE THE BRITISH ISLES

BY

A. J. HERBERTSON, M.A., Ph.D.

Professor of Geography in the University of Oxford

NEW AND THOROUGHLY REVISED EDITION

BY

J. HAMILTON BIRRELL, M.A., F.R.S.G.S.

*Lecturer in Geography, Heriot-Watt College, and Tutor in Commercial Geography
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PREFACE TO THE NEW EDITION.

THE book has been thoroughly revised and the statistics brought up to date by Mr J. Hamilton Birrell, M.A., Ph.D., Lecturer in Geography, Heriot-Watt College, and Tutor in Commercial Geography to the Workers' Educational Association, Edinburgh.

EXTRACT FROM THE PREFACE TO THE FIRST EDITION.

In this short book it is impossible to treat the economic geography of every country in an exhaustive manner. Nor is it necessary. It is not important that the beginner should know all about every country. It is important that he should know the main facts about the most important and typical countries, and accordingly certain countries have been chosen for fuller treatment. Having thoroughly mastered the facts for one type of country, the student finds it easy to treat similar but unknown countries in like manner from the larger geographical and statistical hand-books. This personal compiling of economic geography of different countries by the student should be a marked feature in all advanced classes.

The book is divided into two parts—(1) General ; (2) Regional. A word may be said about the arrangement of the regional descriptions. An attempt has been made to arrange the British lands beyond the seas so as to secure some educational continuity, which is lacking in the order of treatment usually adopted. The temperate states, which most resemble in their conditions those of the British Isles, are taken first, and the tropical lands last. The student confining his attention to the British Empire will find the plan of the book suits his requirements, for he has only to read straight on to the end of Chapter XIV. (omitting Chapter XI., which deals with the non-British temperate lands of the southern hemisphere, and some para-

graphs of Chapters XIII. and XIV.), and in addition the *Commercial Geography of the British Isles*.

Chapters XV. to the end discuss the economic geography of non-British civilised lands, beginning in the Far East, where modern industrial methods are in their initial phase, passing by Europe to America, where they have been most fully developed.

Chapters VIII.-XIV. give an account of the regions producing on the whole mainly raw materials, and the order adopted is from the better to the less known ; Chapters XV. to the end deal with the countries with considerable or extensive industrial development, and the order is from the simpler to the more complex.

Statistics are given for purposes of illustration and not for memorising. Readers are strongly advised to supplement them by reference to the latest edition of the *Statesman's Year-Book*, the most complete of geographical statistical manuals, from which and from official reports the statistics in this book are taken ; or failing that, to *Whitaker's Almanack*. Every teacher should himself use, and make his students familiar with, the methods of employing the more important blue-books and consular reports, which should be found in all free libraries. The daily newspaper should be scanned for new information—which, however, in many cases requires to be carefully tested before being fully accepted. Commercial newspapers are practically indispensable both to students and teachers, and are very reliable. The *Board of Trade Journal* should be regularly consulted.

It is impossible to give a complete list of references to official publications and books of all kinds consulted in preparing the lectures on which the book is based. Valuable bibliographies will be found in Mrs Herbertson's *Descriptive Geographies from Original Sources*. Readers desiring fuller information are referred to *Chambers's Encyclopædia* and Chisholm's *Handbook of Commercial Geography*.

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COMMERCIAL GEOGRAPHY OF THE WORLD

OUTSIDE THE BRITISH ISLES.

INTRODUCTION.

GEOGRAPHY deals with the distribution of things on the Earth's surface, Economics with the production, elaboration, exchange, and consumption of wealth. Economic Geography treats of the distribution on the Earth's surface of natural products of economic importance, and of the activities arising from their transportation, elaboration, and exchange. Economic geography has a twofold function. In the first place, it presents an accurate picture of the existing economic resources of the world; and in the second, it suggests ways in which these may be modified to the benefit of mankind. Tea, for example, which is gradually becoming the chief non-alcoholic drink of the world, will thrive on well-drained slopes receiving abundant showers, heat, and sunshine in summer, and it is hardy enough to bear a touch of winter frost. Wherever these conditions are combined, tea might, geographically speaking, be cultivated. Other considerations, however, come in. The economic conditions must also be suitable. Rent must be

reasonable, labour plentiful and cheap, and markets readily accessible.

Economic conditions are not necessarily unvarying. Thus, to take familiar instances, the application of steam-power to manufacture has altered the distribution of the great industrial centres, and concentrated population on the coal and iron fields. The development of electricity as a motive-power is increasing the economic importance of abundant water-power, and is tending to decentralise industries. Among economic factors, none perhaps is more important than density of population. So long as Australia was but sparsely inhabited, manufactures could not develop except on a small local scale. With the increase of population—that is, of possible purchasers—their development has begun.

Geographical conditions are fundamental and relatively unchanging. Climate, the chief geographic factor of economic importance, depends mainly on causes beyond human control. Indirectly, indeed, man can do something towards modifying its influence. The cutting down of the forests in the Mediterranean basin, though it cannot be said to have modified the Mediterranean climate, has appreciably diminished the fertility of large areas. Forests no longer check the heavy rains from gathering into torrents, which sweep the soil along with them, exposing bare, unfertile rock. Here man has played the spendthrift; elsewhere he has toiled to better purpose, draining the marsh, sinking wells in the desert, or introducing valuable plants and animals.

The task of economic geography is to select from the mass of geographic conditions those of economic

importance. In the chapters immediately following we shall consider the principal facts of the distribution of land and water, of plain and mountain, of climates and products, of populations and of their economic activities. After this has been done for the world in general, selected typical regions will be studied in greater detail, and their trade in the third decade of the twentieth century will be considered.

PART I.

GENERAL ECONOMIC GEOGRAPHY.

CHAPTER I.

LAND AND WATER.

Proportions of Land and Water.—Five-sevenths of the Earth's surface is covered by water, which, except for the fish of the shallow seas near the coasts, is almost unproductive. Until comparatively recent times the oceans have proved formidable barriers to commerce. Of the two-sevenths of the Earth's surface which consists of land, the greater part, as will be seen from the globe, is found in a hemisphere whose pole lies in the west of France, and the commercial centre of the land hemisphere, or land-centre, may be taken as coinciding approximately with the English Channel. Within this hemisphere nearly half of the surface consists of dry land, whereas

in the other half of the globe nine-tenths of the surface is covered with water.

Routes radiating from the Land-Centre.—The English Channel is the centre from which most of the great world-routes radiate, passing southward and westward across the Atlantic, or eastward by the Suez Canal. To the north the water-routes are blocked by ice-bound seas. Great land-routes have been built, the Great Siberian Railway to the east, and the Canadian Pacific and the other trans-continental lines of North America from the end of the northern transatlantic steamer-routes to the west. The Central American isthmus has been pierced by one canal, at Panamá—the western equivalent of the Suez Canal—and another has been planned.

Land and Water Hemispheres.—When we look at a globe on which the height of the land is shown, we observe that most of the land slopes towards the Atlantic, into which, or its bordering seas, the majority of the great rivers flow. The bulk of the lowlands of the world are therefore connected with the Atlantic. The Pacific Ocean, on the other hand, is bordered by lofty mountain-systems, which leave but a narrow coastal strip of lowland along that ocean, and cut it off from easy communication with the main mass of continental lowlands. This circumstance is of great economic importance. Not only is communication easier across lowlands than across mountains, but the lowland is also, as a rule, more productive and more populous. The Atlantic is, therefore, by far the most important ocean, as the most valuable lands from an economic point of view slope towards it.

Let us now look more closely at the configuration of each continent on a good orographical map, or on a globe which shows contours.

Europe is deeply penetrated on all sides by sea, so that no part is far from the sea and its ameliorating influences.

The chief European seas are the North and Baltic Seas, the latter with the Gulfs of Finland and Bothnia, in the north; and the Mediterranean, with the Adriatic and Black Seas, in the south. The northern and southern seas present many contrasts.

The North and Baltic Seas lie in the midst of the lowlands, which converge towards them. A great part of these lowlands is fertile; communication across them is easy; and the North Sea rivers have tidal estuaries, which give ready access to waters which are shallow and rich in fish. On the other hand, the seas are stormy and often foggy, the shores of the Baltic are frozen in winter, and powerful ice-breaking steamers are required to keep the harbours open.

The Mediterranean is surrounded by lofty mountains, and only the north of the Black Sea skirts the European plains. The alluvial river-valleys and the deltas of its almost tideless waters are very fertile. With the exception of the Danube and the Rhone, the rivers are not of great importance as trade-routes. A mountain barrier on the north and a desert barrier on the south shut in the Mediterranean, which has a narrow exit to the Atlantic by the Strait of Gibraltar, and also, since the opening of the Suez Canal, to the Indian Ocean by the Rea Sea.

Asia slopes to the north and to the east from a

central core of mountains, which rise from two to four miles above the sea, forming a practically impassable barrier lying east and west on both sides of the parallel of 35° N. The northern plain is extensive, and is drained by great rivers, which, however, are frozen in winter, and flow into the ice-bound Arctic Ocean. The Amur crosses a hillier land, but is also annually ice-bound. The Hwang-ho and Yangtse-kiang are the great rivers of the east. Both have formed rich alluvial regions. The Yangtse-kiang is navigable for ocean steamers for nearly one thousand miles. Much of the Indo-Gangetic plain, between the Deccan and the Himalayas, is equally rich. The festoons of islands which lie to the east and south-east of Asia are mountainous and volcanic. The fertility of the rich volcanic soil is intensified by the monsoonal climate (see page 24). In the island-dotted eastern seas navigation is easy, except for the dreaded typhoon at the change of monsoon, and has long been important.

Australia consists of a western plateau separated by central lowlands from the eastern mountains, which rise above a narrow coastal plain bordering the Pacific. For climatic reasons the eastern mountain region and coastal plain are the most productive and populous (see pages 81, 84, and 85).

The **Pacific** is dotted with numerous island groups, of volcanic or coral origin, often fertile, but of no great extent. New Zealand and New Caledonia, which will be considered with Australia, are the most important islands in the south.

The **New World** turns, as it were, its back to the Pacific. Mountains border the Pacific coast of both

North and South America from north to south, except at the isthmuses of Panamá and Tehuantepec.

South America contains a great central lowland, between the Andes in the west and the Brazil and Guiana highlands in the east. It is drained by three mighty river-systems—the Plate, the Amazon, and the Orinoco—to the Atlantic. These rivers and their chief tributaries (except those of the Amazon) are navigable almost to their sources. A tidal bore occurs in the Amazon, and is dangerous to navigation.

Volcanic and limestone rocks, some of coral origin, predominate in the **West Indies** and **Central America**. The volcanic regions are fertile. The West Indies belong to the Atlantic region. In Central America, however, the Pacific slope is the most productive part.

In **North America**, as in South America, a vast lowland stretches east from the western mountain barrier. This is easily penetrated from the Atlantic by the great rivers Mississippi-Missouri and St Lawrence, which drain the centre and south of the great plains. The utility of the Mississippi is diminished by the shallowness of the distributaries crossing the delta. The St Lawrence is frozen in winter. It is connected with a great chain of lakes—Superior, Michigan, Huron, Erie, and Ontario. Below the last-named are rapids, and above it the great falls of Niagara. Both obstructions have been avoided by canals. The Hudson, though small in comparison with the Mississippi or the St Lawrence, is exceedingly important, for it makes a break in the eastern or Appalachian highlands, and affords a waterway to the St Lawrence system from the ice-free port of New York at its mouth. The Nelson and Mackenzie systems have the

same disabilities as the Siberian rivers, flowing to oceans frozen many months annually, and being themselves ice-bound in winter. The rivers flowing to the Pacific are of greater consequence than the corresponding rivers of South America, but are not very important as routes to the interior, except the Yukon in the far north-west.

CHAPTER II.

CLIMATE BELTS.

THE climates of the world determine the economic regions. Plants and animals are more closely dependent on climate than man, who penetrates to most parts of the world. Yet even man cannot live in health and perform arduous labour in regions where the climate is too extreme.

Elements of Climate.—The chief elements of climate are heat and moisture. Sunshine and wind are next in importance.

The heat at the Earth's surface is derived from the Sun's radiations. These pass through the atmosphere without material diminution, but are arrested by land or water. But for modifying local influences, the total number of hours of bright **sunshine** is theoretically the same at all parts of the globe, though their distribution throughout the year varies greatly in different regions. Between the tropics it is possible to have twelve, or nearly twelve, hours of sunshine every day; at the poles the year consists of a single long day and a single long night, all the sunshine being concentrated into the day—that is, the summer

six months. Mountains greatly diminish the hours of bright sunshine in the valleys, and the presence of fog or cloud lessens the quality of the light. There is also a considerable difference in different regions in the amount of solar radiations arrested by a square mile of the Earth's surface; and a surface sloping towards the Sun is better situated than one sloping in the opposite direction. Hence in Germany and France the southern slopes are planted with vines; in the south of Australia, the northern slopes.

Heat Belts.—At the equator the rays fall almost vertically at all seasons, forming the hot belts, where it is never cold. At the poles they fall more nearly horizontally, forming the cold belts, where the soil for the greater part, or even the whole, of the year is frozen. Between the hot and cold belts lie the temperate belts—consisting of two warm temperate belts where the mean annual temperature is over, and two cool temperate belts where it is under, 50° F. The temperate belts are the best-cultivated and the most densely peopled regions of the world; but the hot belt is that in which vegetation attains its greatest luxuriance. The cold belts are frozen deserts. The limits of the cold belts may be traced by drawing lines (isotherms) through places where the mean temperature of the warmest month does not rise above 50° F., which is necessary for the cultivation of cereals. The limits of the hot belt may be traced by drawing lines through places where the mean temperature of the coldest month is 65° F., which is high enough for continual growth if there is a sufficient supply of moisture.

Temperature falls very rapidly with altitude (1° F. every 300 feet). Mountains, therefore, pass through various heat zones. Even in the hot belt, mountains of sufficient altitude have eternal snow on their upper slopes. A mountainous land in temperate or tropical latitudes has greater variations of temperature than a plain in the same latitudes.

Wind Regions.—The winds are of great economic importance, especially on and near the ocean. They may determine the wet or dry weather on which the growth or maturation of plants depends, and which regulates the flow of the rivers. They directly control the movements of sailing-vessels, and to a certain extent even of steamers. They also indirectly affect them through the surface currents of the ocean, which are driven by the winds.

The regions of calms approximately coincide with the equator, the tropics, and the polar circles. The doldrums, or calms of the equator, used to be greatly dreaded in days when ships depended entirely upon their sails. The sub-tropical regions of calms are known as the 'horse latitudes.'

Between the equatorial and sub-tropical calms are the zones of steady or trade winds, which blow constantly from the north-east in the northern, and from the south-east in the southern, hemisphere. In these two zones, however, certain lands near the equator have alternately north-east and south-west winds in the northern, and alternately south-east and north-west winds in the southern, hemisphere. These winds are monsoon winds.

Between the sub-tropical and polar calms are the belts of stormy westerly winds, which in the southern

hemisphere are known as the 'brave west winds' of the 'roaring forties.' Here the winds are not constant, but variable; winds from a westerly direction, however, predominate.

The courses of sailing-ships, and to a certain extent those of steamers, are planned so as to take full advantage of favourable, and to avoid adverse, winds. A ship sailing southward from the English Channel keeps near the west coast until it feels the influence of the north-east trade-winds, before which it steeds towards Brazil. It skirts the eastern coast of South America, making use of the Brazil current until near the 'horse latitudes,' and then turns eastward and takes advantage of the 'brave west winds' in the South Atlantic and Indian Oceans if its destination is Australasia. A ship returning from Australasia does not come back in the opposite direction, but sails still eastward with the west winds across the Pacific, and enters the Atlantic round Cape Horn, makes for the eastern coast of the South Atlantic, utilises the south-east trades, crosses the north-east trade belt near the western side of the ocean, where the current flows northward, and traverses the North Atlantic to the Channel before the stormy west winds.

Rain Regions.—In most regions rain falls most abundantly in summer, when the heated air can contain the greatest quantity of water as vapour and tends to ascend to cooler regions, where the vapour is condensed. Equatorial regions, which have perpetual summer, are the雨iest in the world. The seasonal variations which characterise other regions are almost entirely absent, though there are short dry

periods, or rather breaks, when the Sun is overhead at the tropics.

North and south of the equatorial belt, extending from about 10° to 20° , there are two seasons in a year, the wet when the Sun is exactly or nearly overhead at noon (which occurs twice each year), and the dry during the rest of the year. The Sudan and the monsoonal regions lie in this area. They are warm at all seasons, and the rainy season almost coincides with the hottest period of the year. In the case of India and south-eastern and eastern Asia the summer winds blow over the ocean, and become abundantly laden with moisture, causing torrential summer rains, and the region of alternate rainy summers and dry winters extends to much higher latitudes.

Dry deserts are found round both tropics in the centre and west of the continents. In the case of some, as, for example, the desert of Sahara in Africa, or the Australian deserts, the winds blow from cooler to warmer regions and mainly over land. They therefore contain little moisture, and do not readily part with what they have. Other deserts, like Tarim and Gobi in Asia, are surrounded by mountains which arrest the rain.

Temperate coastal regions, in latitudes higher than about 40° - 45° , where westerly storm-winds prevail, have rain at all seasons, but especially in winter, when the winds are strongest and the land towards which they blow is coldest.

Regions like the Mediterranean, California, central Chile, the south-west of Cape Colony and of Western Australia and Victoria, lie in the dry area in summer, and in the moist west-wind area in winter. The

combination of mild wet winters and hot dry summers leads to very special economic characteristics.

Up to a certain height, which varies in different parts of the world, mountains receive more rain than the lands at their base. A cloud-belt is found girdling most lofty mountains, in which it is always damp. Above this belt the precipitation steadily diminishes.

CHAPTER III.

ZONES OF LIFE.

CORRESPONDING to the climatic belts are equally well-defined zones of plant and animal life, for climate controls the great divisions, while differences of soil determine merely secondary divisions, of the world of life.

Tundra.—The surface of parts of the frozen deserts thaws in summer. Water accumulates in the hollows, forming a marshy land known as the tundra. Reindeer moss, the food of the reindeer, is the only plant of economic importance. The dog and the reindeer have been domesticated by the inhabitants, who are partly pastoral, and partly hunters and fishers. They wander northwards in summer, and southwards in winter, towards the confines of the forest, to hunt fur-bearing animals such as the sable and the lynx, or larger game such as the stag and the elk.

Temperate Forests.—Except where the rainfall is too small, the cool belt is forested. The forest belt stretches across the northern hemisphere between 50° and 60° N., in eastern Asia crossing the arctic

circle, in central Asia having its southern limit about 55° N. In the east both of the Old and New Worlds it skirts the coast, and gradually becomes more and more tropical in character. In the southern hemisphere, Tasmania, New Zealand, and southern Chile are covered with temperate woods. The trees are conifers in drier or colder regions, and deciduous in wetter or warmer regions. Conifers predominate on the polar border of the forest, the interior, and the upper mountain-slopes; deciduous trees on the equatorial border and nearer the coasts. Many of the trees yield excellent timber. Among the pines, white, yellow, and red woods, and pitch-pine from the North American or European forests, are more used in buildings than any other wood. Conifers also yield resin and turpentine. The chief deciduous trees are the oak, beech, ash, walnut, maple, and hickory.

Clearings in Temperate Forests.—Much of the agricultural land of temperate regions is found where forests have been cleared, as in our own islands and most of western Europe. On the equatorial and oceanic borders of the temperate forests the hardier cereals flourish, such as oats, rye, barley, and wheat. Of these the hardiest is barley, which grows both farther north and farther south than the others. Oats and rye grow best in the cooler, wheat in the warmer areas of this belt, which afford the warm and comparatively dry summers necessary for ripening that grain. Potatoes, turnips, and beet are the chief root-crops, and flax and hemp the principal industrial plants. All kinds of vegetables, such as carrots, onions, peas, beans, cabbage, &c., are successfully cultivated. Fruit-trees do best in regions where the

summers are late and the early part of autumn is dry. The chief fruits are the cherry, apple, pear, and plum; the gooseberry, raspberry, blackberry, and currant; and smaller plants, such as the strawberry.

Rich grasses, which yield excellent hay, are among the most important temperate crops. On the plains they grow luxuriantly in meadows near the streams, and in the troughs of the valleys. Grasses also clothe the upper slopes of mountains above the tree-limit, and below the more barren area in which heather and bracken are interspersed with peat-bogs. Sheep thrive especially well on mountain and upland pastures, but are also kept in lowland meadows. Cattle and horses do better on lowland pastures. Pigs, poultry, and other animals are also domesticated in many parts. Few wild animals still remain in the forests of the settled region. Stags, foxes, and fur-bearing animals are hunted in the wilder parts.

The south temperate forests are denser than the northern ones, which they resemble in most characteristics. They cover a much smaller area, and have been exploited only in comparatively recent times. Fruits, timber, and, in the case of New Zealand, gum from the Kauri pine are the chief economic products of regions still forested, and sheep of the grass-lands.

The north temperate forests and their clearings are thus self-supporting regions, supplying all the needs of life. The uncleared forests have but few inhabitants. The clearings support a great number, in some of the richer agricultural lands more than two hundred per square mile. On the whole the density increases from pole to equator, and from the interior towards the coast.

Steppes or Temperate Grass-lands. — Grass-lands cover vast areas on the equatorial side of the temperate forests. In the Old World they extend from Hungary to Manchuria, between 35° and 50°, occasionally reaching as far north as 55° N. In the New World they lie between the Mississippi and the Rocky Mountains south of 55° N., and also cover much of the land east of the Andes and south of the Plate estuary.

The steppes have scorching summers and severe winters, with relatively little rain, which falls only in summer. The grass rushes up in the spring to more than a man's height, and is shrivelled up and often burned before winter. The most fertile tracts of steppe-land are on the forest side. The equatorial side of the steppe gradually merges in the desert. The steppes support innumerable flocks and herds, sheep and goats, cattle and horses, and, on the confines of the desert, camels. Milk, cheese, and wool are the chief products of commercial value, in exchange for which the steppe-dwellers, who are nomadic or semi-nomadic in the Old World, obtain grain, sugar, tea, and such manufactured articles as they require.

The steppes lend themselves readily to economic development. The constant decay of successive crops of grass forms an abundant supply of rich vegetable mould, which renders the soil exceedingly fertile. Where the rainfall is sufficient and the inhabitants have enough skill and energy to engage in agriculture, heavy crops can be obtained. The wheat of Hungary and southern Russia, and of the Dakotas and Manitoba, is grown on steppe-land. As the virgin soil becomes exhausted, rotation of crops is introduced, and mixed farming and stock-rearing are also carried on.

With the spread of agriculture the density of population increases, and with it commercial possibilities. The farmers of the steppe find it profitable to grow grain for the market as well as for home consumption, and the development of steppe cultivation has been rapid since modern means of communication provided a cheap ready means of placing produce on the market.

Warm Temperate Forests with Winter Rains.—The Mediterranean type of climate—hot dry summers and mild winters, with the heaviest rain early and late in the season—gives rise to a Mediterranean type of vegetation, whose distribution has already been noted (see page 24). The resting period of this vegetation is not in winter, as in our own country, but during the dry summer. The leaves of most plants are tough and evergreen, and thorny aromatic plants abound. Cork and evergreen oaks, cedar, and pines of various species are valuable either for their bark or timber; the mulberry is grown for its leaves, on which the silkworm feeds; and a very large number of fruits, which the dry, warm summer brings to perfection, are cultivated. Among these are the chestnut, walnut, acorn (furnishing valonia), carob (furnishing the locust-pod), olive, orange, lemon, fig, pomegranate, almond, apricot, and peach; but the most important of all is the vine. Barley and wheat are cultivated, but maize is not suited to the climate. Rice, however, can be grown under irrigation in the well-watered alluvial river flood-plains and deltas.

Except on the mountain-sides, grass requires careful irrigation. Sheep are driven to the mountains in summer, and to the plains in winter. Cattle, which

are not numerous, are used as draught animals rather than for supplying milk. Goats and donkeys are proportionally more numerous, and horses less so, than in the forest clearings. In general, animals which live in drier conditions and need less succulent food are more numerous.

The valleys and coasts are agricultural; the mountains and plateaus are pastoral. The former are densely, the latter sparsely peopled. Commerce is chiefly in agricultural produce, such as the olive, the orange, and the produce of the vine, which are much in demand, and which require climatic conditions found only in a relatively limited area.

Warm Temperate Forests with Summer Rains.—The warm temperate forest regions have a dry and cool or cold winter, which forms a resting period. They cover the eastern portions of the continents on the polar sides of the tropics to about forty degrees, and are in the monsoonal rainy regions north of the tropics in Asia, and in the normal trade-wind rainy regions elsewhere.

The great heat and moisture of summer promote the rapid growth of plants, whose leaves, many of which are evergreen, and timber are on the whole more valuable than their fruits; although fruits, especially of a succulent sort, are common. Rice, the most important cereal, is grown on all low-lying lands that can be flooded. Inferior varieties flourish on terraced mountain-sides. Wheat, maize, and millet are cultivated. All kinds of citrons—oranges, lemons, &c.—flourish. Mulberries, many of which are planted as shade-trees, feed large numbers of silkworms. Tea is the characteristic plant of eastern Asia. It has been grown

with success in Natal, and could be cultivated in other regions with a similar climate (see p. 13). In South America it is replaced by *maté*, or Paraguay tea. Many valuable timber-trees are used locally. Cedars are imported from North America for making pencils, and Eucalyptus from Australia for paving. Turpentine is obtained from the pines of the eastern United States. The bamboo can be used for food, for clothing, for building, for drainage, and indeed for almost every conceivable purpose. Eucalyptus, castor-oil, and croton trees yield oil. Hemp is grown both for oil and fibres. Cotton, by far the most important textile plant, flourishes in this region, especially in North America, where the sea-island variety of the coastal swamps is long, strong, and fine. The ramic or China grass, a great nettle, yields what is perhaps the silkiest and strongest of vegetable fibres, and one which will be used more and more as improvements are made in the processes of preparing it for spinning. In China a laurel is used for making paper, and ginseng, opium, and other drugs are cultivated, as well as tobacco, which is grown in all parts. Many of these plants require careful cultivation. Agriculture is more carefully and laboriously carried on in eastern Asia than anywhere else in the world. The flood-plains and deltas of the great rivers Hwang and Yangtse are naturally very fertile, and the crops are greatly increased by elaborate methods of irrigation. Domestic animals are few, the pig, dog, and poultry being the most important. Population is very dense; in some provinces of China the number is over four hundred to the square mile. Notwithstanding this density, the

methods employed in manufactures are frequently of an antiquated type.

The North and South American, South African, and Australian regions of this character are not nearly so thickly peopled, but in comparison with regions farther west in the same latitudes the population is dense. Most of the more laborious work is done by negroes, Indian coolies, or Polynesians, under European overseers. The higher lands, where the more temperate climate is suited to vegetation belonging to higher latitudes, especially in the lee of the mountains where the rainfall is lower, can be cultivated by Europeans.

The Dry Deserts are arid for lack of rain, and not from natural infertility. On the contrary, the soil is exceedingly fertile wherever irrigation is possible. The growth of date-palms, vegetables, cereals (maize, wheat, and millet), and pulses is restricted to the few oases, whither water is carried underground from some wadi, or where a spring exists. Acacias and other gum-yielding trees, frankincense, myrrh, and other spices grow in specially favoured spots. The richest lands are those where water is available, as, for instance, along the Nile or Euphrates; or where artesian wells have been sunk, as in southern Algeria, western Queensland, and parts of the western United States near the poorer grass-lands. Cotton, pulses, and cereals are among the products of Egypt, Turan, and Mesopotamia. In irrigated regions, such as parts of the Murray basin in Australia, fruits of all kinds flourish, more particularly Mediterranean species.

The desert is very sparsely inhabited. On the poor pastures at its edge goats and camels are kept.

In the desert itself caravan-driving is the chief occupation of all who are not settled in the oases. Gums, dates, and hides are the chief products, but commerce will long be small except in the favoured strips of fertile land flooded by the great rivers.

Savanas or Tropical Grass-lands.—On the equatorial side of the deserts, where the single rainy season of summer becomes marked, vegetation increases, and rich grass-lands intersected by tree-bordered streams predominate. These are savanas, which are distinguished from steppes by having hot instead of cold winters. Savanas are also found throughout inter-tropical lands above the lowlands. They can be traced in Central America and in the West Indies, in the llanos, campos, and catingas of South America, and also in the northern part of the pampas. They form a complete ring outside the Congo basin and the Kalahari Desert in Africa, which has therefore a certain unity from the southern veld to the park-lands of Uganda and the Senegal. Tropical grass-lands are also found in southern Asia and Persia, in the Deccan, on the uplands of the Malay Peninsula and Archipelago, and in the northern part of Australia.

In Africa herds of big game still wander about many parts of the savana, but the cattle-keeping races are gradually encroaching from both north and south. In America and Australia stock-farmers occupy many thousand square miles. The first step towards the exploitation of the savanas is the keeping of sheep and goats on the drier, and of cattle on the wetter parts. This will probably always be the most important occupation on the fringe of savana nearest to the desert. The savana, however, on the other side gradually

passes into dense tropical forest. This richer region is capable of very intense cultivation, and is already cultivated by the native tribes. Banana palms and coffee shrubs are the typical economic plants. Millet, and in Africa maize, on the higher lands, rice on the moister lowlands, especially of the East Indies, sugar-cane in all parts, and cotton are the chief crops. Ground-nuts are widely grown.

Europeans cannot endure hard manual work in tropical savana and forest lands without suffering greatly in health, and hard work is at present left, and probably will long be, to the native races. The economic possibilities of those lands are great, but as yet they are comparatively little developed.

The Equatorial Forests are always hot and moist. Rain falls at most seasons, but most abundantly when the noonday sun is overhead. Equatorial forests of the densest description cover the lowlands within fifteen degrees of the equator, and near the east coast extend to higher latitudes. They contain many valuable timber-trees, such as mahogany, ebony, and ironwood. The oil-palm is the most important tree in the African region. The coco-nut palm flourishes round the coast, especially of coral islands. Its dried kernels form the copra of commerce. The sago-palm is characteristic of the Malayan region, and mandioca or manioc, from which tapioca is made, of the South American one. Rubber is tapped from rubber trees and innumerable lianas that wind about the forest-trees. Spices abound, such as cloves in Zanzibar and Pemba, and allspice, nutmeg, and cinnamon in the Moluccas and other equatorial islands. The banana grows rapidly from cuttings planted in forest clearings.

Coffee and cacao flourish on the hill-slopes, the former at higher elevations than the latter. Neither can stand frost, and both require much heat, but are usually protected from direct sunshine by planting shade-yielding trees. Coffee is widely distributed, and may be grown throughout the forest and savana areas where sufficiently moist. Cacao, while cultivated a little in Ceylon and Java, is grown mainly in Ecuador and Brazil, in the West Indies (especially Trinidad), along the shore-lands, especially the Gold Coast, and on the islands of the Gulf of Guinea. Cotton and sugar-cane are important crops on the lowlands.

The unhealthiness of the tropical forests is the chief drawback to their exploitation. When first cleared the forest becomes even more unhealthy than before, but afterwards grows less noxious. Even the scanty inhabitants are not proof against the climate.

Ivory, long the chief trade in the African forests, is still playing a part in the opening up of equatorial Africa, and is inextricably associated with the slave-trade, which is not yet quite suppressed in the Dark Continent.

The resources of the vast intertropical regions are as yet hardly tapped, and constitute a most valuable reserve which will be exploited as means of transport are improved, routes are opened up, and the pressure of economic needs becomes greater.*

* See *Commercial Geography of the British Isles*, Chaps. VI. and VII., where the distribution of economic products imported into Great Britain is given under each product.

CHAPTER IV.

MINERALS.

THE distribution of minerals cannot, like that of vegetation, be considered in a series of zones.

Coal, the only important mineral of organic origin, is very widely distributed, but is not at present found or used in any quantity between the tropics. This may be explained partly by our ignorance of the mineral wealth of many tropical lands, and it may also be that equatorial conditions do not favour the production of coal, which is composed of highly compressed vegetation, reduced to almost pure carbon by the removal of most of the oxygen and other gases, as well as of the water. At present most coal is worked between 35° and 57° N. in the United States, the United Kingdom, and north central Europe, but coal-mining is becoming increasingly important in all parts of the world, from Spitsbergen to New Zealand, from China to Chile, and from Alaska to Natal. Three kinds of coal are found—common black or bituminous coal, anthracite, and brown coal or lignite. Anthracite gives off no flame when it burns, most of the inflammable gases having been distilled from it. When this process is carried still further, graphite (plumbago or black-lead) is formed, which is plentiful in Siberia and Ceylon. Brown coal or lignite is vegetation less consolidated than in coal. Peat is a carbonised mixture of marsh plants.

Petroleum (mineral or rock oil) is formed by the slow distillation of organic matter in the rocks. In some

places this rises to the surface ; elsewhere it forms reservoirs, which can be pumped up by boring the overlying strata. It is abundant in Pennsylvania, California, and other parts of the United States, the eastern Caucasus, Mexico, Galicia, Hungary, Romania, Burma, Sumatra, Japan, Peru, Canada, and many other localities.

Paraffin-oil and **wax** are extracted from bituminous shales in Scotland, France, and New South Wales.

Asphalt, or pitch, found in the Pitch Lake, Trinidad, as well as near the Dead Sea and in several parts of Europe, is used for paving and as a damp-proof material. The Val de Travers asphalt, extensively used for paving, is a bituminous limestone found in Switzerland.

A large number of the rocks composing the earth's surface are used as **building-stones**, especially those which are durable and easily quarried. Soft **clays** are fired into bricks. Clays of special fineness are used for making porcelain—e.g. kaolin, a decomposed granite.

Common Salt (sodium chloride) is found as a solid on parts of the surface of the land, and in solution in sea-water, from which it is extracted by evaporation, or, in very cold regions, by freezing. It is the only mineral used as food, and is so valuable that in some countries it is made a government monopoly—e.g. in India. In a solid form it is found (*a*) efflorescent in dry regions such as the salt deserts of Iran or Turan, or of the Great Basin of the North American Cordilleras, and round lakes with no outlet, where evaporation is at least as rapid as the inflow of fresh water, such as Lake Eyre in Australia ; (*b*) as rock-salt, usually accompanied by sulphate of lime, especially in triassic rock. as in the

Salt Range of India, so called from its deposits of salt; and (c) in underground deposits, from which it is obtained by pumping water into a small mine, allowing it to become saturated, and then pumping it out and evaporating it. Brine-springs are found in many parts. The older rocks contain no salt, the original deposits having probably been washed out in the course of ages. In much of Africa it is practically non-existent, and is so valuable as to be used for money.

The metals, the most valuable of the minerals, are found mainly in igneous and crystalline rocks, unlike the preceding, which are found in stratified rocks. Most metals are found as ores, either pure or in combination with others. They occur (a) in regions which have been disturbed by crustal movements, the veins of ore lying in fissures in which it was deposited in solution; (b) in volcanic regions. They are rare in undisturbed rocks, and consequently the great alluvial plains of the world are poor in minerals.

Iron, by far the most important metal, is very widely distributed in different forms. The black or magnetic oxide, which is richest in iron, is found in central and northern Sweden, the Urals, Canada, Pennsylvania; red haematite, consisting of more than two-thirds of iron, is found as kidney ore in the north of Spain, in the Furness district of Lancashire, and as crystalline specular ore in the island of Elba. Brown haematite is similar in composition to the red, with a larger proportion of water, and is the most important ore of South Wales, Antrim, France, and Germany. Spathic iron ore, a carbonate of iron, forms the famous iron mountains, the Erzberg, in Styria. The same carbonate

in an impure form occurs in the clayband and black-band ironstones common in Britain.

The ironfields most worked are either near coal, as in Britain and Pennsylvania, or near the sea, by which ore can be cheaply transported to coal, as in Spain and Sweden.

Tin is less liable to decompose than iron, and is therefore largely used for covering iron to form tin-plate. Tinstone (or cassiterite, a binoxide of tin) is found abundantly in the Malay Peninsula and islands, and in Bolivia, Australia, and Tasmania.

Copper is rapidly growing in importance with the developments of electricity, as it forms an admirable conductor. The pure metal is found in Russia and near Lake Superior. There are numerous ores, which are mined in south-west Spain, Germany, the United States, Mexico, Chile, South Africa, Queensland, New South Wales, South Australia, Japan, and the Congo.

Zinc is a bluish-white metal used for plumbing and other purposes, and, in combination with copper, for making brass. It is found as blende (sulphide of zinc) in the United Kingdom, the United States, and Australia, and as calamine (carbonate of zinc) on the borders of Belgium and Prussia, in Upper Silesia, northern Spain, and the United States.

Nickel is a bright metal which possesses great strength and malleability, and does not readily tarnish. It is alloyed with steel to strengthen it, and many articles are nickel-plated to preserve them from rust. It is found in combination with manganese in New Caledonia, and in combination with copper pyrites near Lake Superior.

Manganese is chiefly found as black manganese, a

binoxide. It is used to colour glass purple, and as an alloy in making strong steel.

Aluminium is light, very strong and hard, and always remains white. In recent years it has been much used in making air-craft, cycles, &c. It is usually obtained by electrolysis from a clay called bauxite (found at Baux in France and in the north of Ireland), dissolved in molten cryolite, a mineral found in Greenland, the electric power being often derived from waterfalls, such as those of Niagara, Schaffhausen, and Foyers.

Lead, chiefly used for plumbing purposes, is extracted from galena (the sulphide), which is usually associated with some other metal, often silver, which it also pays to extract. Galena is found in most countries with old rocks, and is extensively produced in the United States, Spain, Germany, Mexico, Australia, and the United Kingdom.

Mercury is a liquid metal greatly used for making amalgams of other metals. It is found as cinnabar (the sulphide), from which vermillion is obtained, at New Almaden in California, Almaden in Spain, and Idria in Italy. It is much used in modern gold-mining and in medicine.

Silver is very ductile and malleable, and takes a beautiful polish. It is much used for table articles, ornaments, and coins, as well as for electro-plating, but it tarnishes very readily in the presence of even minute quantities of sulphur.

Native silver is found in Nevada, Mexico, Peru, and Chile, and at Kongsberg in Norway. Half the silver annually produced is obtained from silver-lead ores. There are a great many ores containing sufficient silver, especially in the form of sulphides and chlorides,

to repay extraction. The world supply of silver has greatly increased since 1850; the production in 1920 was about 176,000,000 fine ounces, worth about 5s. per oz.

Gold is heavy, ductile, constant in colour, and so malleable that it can be beaten out into leaves $\frac{1}{250000}$ of an inch thick. It is used for coins, for plating all kinds of ornaments, and for gilding. It is found in all rocks in all lands, in rivers, glacial and sea sands and gravels, as well as in the ocean waters. The alluvial or 'placer' gold is isolated by a series of washings, which float off the lighter materials, leaving the heavier gold as a residuum. In recent years much gold has been obtained from quartz-veins. In regions where means of transport are well developed it is profitable to extract the gold when an ounce can be obtained from a ton of quartz. This is done by crushing the ore, then washing it like alluvial gold, or extracting it by amalgamation.

Gold is abundant, and very widely distributed. It is exceptionally abundant in the western Cordilleras of North America as far north as Alaska, in the mountains east and south of Siberia, in South Africa, in Australia, the Urals, and Romania.

After the exhaustion of the then known placer-mines, the annual production of gold sank in 1881–90 to about £22,000,000 per annum. From 1890 it rose to £96,000,000 in 1915. Since then it has steadily declined to £70,000,000 in 1920, when the share of the Transvaal was almost 50 per cent.

Platinum, the third heaviest metal, resembles gold in most of its properties. It is much rarer, and is principally obtained from the Urals. It is used for making chemical and electrical apparatus and in photography.

CHAPTER V.

MANUFACTURING AREAS.

SOME kind of manufacture is carried on by almost every people, and among many a special taste and skill are developed which give their work local or even world-wide fame. Thus China has become noted for its silks, embroidery, pottery, &c.; Japan for beautiful textiles and pictures, pottery, lacquer, and bric-à-brac of all kinds; India for finely carved ivory, rich inlays, brass-work, and fine textiles, such as the world-famous shawls of Kashmir. The work is manufactured in a literal sense—that is to say, made by hand, with a care and skill which gives it great beauty and durability. The increased demand which results from the opening of foreign markets has led to greatly increased production at the expense of quality, and to the degeneration of once artistic manufactures.

In the Western industrial world manufacturing has come to mean making by machinery, which at the present time is generally driven by steam. A machine turns out with great rapidity a large number of articles, which, however, are inferior in durability, and are marked by a uniformity which is inferior in artistic value, to the variety introduced by the living hand. This monotonous uniformity may perhaps become less universal if the more general use of electricity leads to the setting up of small motors to do the necessary mechanical work for the master crafts-

man, who nevertheless personally inspires and directs every operation.

At the present time it is roughly true that Asia produces handwork, but is in a state of transition, and that Europe and North America are in the mechanical stage. In the other continents the manufactures, though not yet of great commercial importance, are progressing rapidly.

The distribution of manufacturing areas, in the narrower sense, depends on a variety of conditions, of which the chief are: (1) easy access to raw material, which may be either (*a*) locally produced, or (*b*) readily and cheaply imported; (2) available sources of power, of which the commonest are (*a*) coal, for supplying steam or electric power, (*b*) water, for supplying water or electric power, (*c*) oil; (3) abundant and not too costly labour; (4) ready access to markets, which may be (*a*) home or (*b*) foreign, or both. Of these conditions the second is the most essential, it being generally less costly and difficult to bring raw material to the source of power than to bring the source of power to raw material. Where all the conditions are fulfilled, as in our own island country, the industrial outlook is in the highest degree favourable.

Up to the present time it has been commonly stated that the presence of coal is the first essential for industrial development. In this rough generalisation there is much truth, as may be seen by considering the relation between the distribution of manufactures and the distribution of coalfields. In the case of Britain this has already been described (*Commercial Geography of the British Isles*, Chap. IV.).

The Franco-Belgian coalfield supplies fuel for the woollen, linen, glass, and steel factories of north-east France and Belgium. The Westphalian (Ruhr) field yields coal for the iron, cotton, and silk manufactures carried on east of the Rhine, and for the woollen manufactures carried on west of that river. The Saxon, Silesian, Polish, and south Russian coalfields all produce coal which is applied to industrial purposes. Cotton, woollen, and linen are the chief textiles manufactured, and iron is the chief mineral industry.

Similarly, in the eastern United States, the Appalachian coalfields support Pittsburg and many other manufacturing centres. There are, however, a great number of manufacturing centres which depend not on abundant coal, but on abundant water-power, which at the present time is chiefly used for generating electricity, rapidly rising in industrial favour. In Europe the best example is Switzerland, where coal is absent and water-power is abundant. In the United States the presence of coal has created the Allegheny industrial region. Water-power, on the other hand, in the New England Highlands and also along what is known as the Appalachian fall-line, has helped to determine the site of the New England textile towns and the rapidly growing cotton-factories of the cotton-growing states.

CHAPTER VI

TRANSPORT.

HITHERTO we have but incidentally referred to the movement of produce from place to place. The study of this movement constitutes that branch of economic geography which is properly termed commercial geography, and forms its most dramatic chapter. This movement is partly determined by human needs and partly by facilities of transport. The development of transport enlarges the supplies and desires of man, so that we may say that as a rule increase of commerce and development of easy means of communication proceed hand in hand.

The means of transportation are very numerous, and differ in different parts of the globe. The chief methods are (1) porters; (2) baggage-animals; (3) draught animals; (4) mechanical propulsion, utilising (a) wind and current, (b) steam-power or other source of energy depending upon heat, or (c) electric energy.

Human beings are the most expensive agents of transportation, as they must not merely be fed, but in most cases paid as well, while their carrying power is relatively small. Human transport cannot be employed unless the route lies through fertile regions, where food is easily obtained, for a porter cannot carry his food as well as his load for any length of time. It is resorted to chiefly where no roads but footpaths exist, or under such special conditions as those in intertropical Africa, where the tsetse fly is a fatal enemy to horses and cattle.

The use of pack-animals, though more satisfactory, leaves much to be desired, both in the weight carried and the cost of transporting it. The food problem becomes an important one, especially in infertile regions. Narrow tracks are the characteristic roadways of regions where pack-animals are used, and this mode of transport is commonest in mountainous or densely wooded countries.

Among the animals used for carrying baggage are the yak in the cold snowy regions of Tibet; the llama in the Andes; the camel across the arid desert and the poor steppes which border it; the horse, mule, or donkey mainly in temperate lands.

With the introduction of a wagon which can be drawn, the transporting power of animals becomes very much greater, but the quantity which can be carried and the rate of transport largely depend on the nature of the roads. Over the roadless karroos of South Africa the ox-wagon is the chief means of transport beyond the railway; but in countries where roads exist horses are most commonly employed for haulage.

In the nineteenth century mechanical traction by means of steam-engines was gradually extended over great areas, chiefly in the temperate zone. This has proved a cheaper and more rapid means of transport on land than any other. The chief disadvantage is the preliminary outlay involved in surveying and constructing a carefully made permanent way with slight gradients. Expensive engineering works have been necessary, especially in mountainous districts, where innumerable ravines have to be bridged, and where the road has often to be tunnelled for long

distances through the solid rock. Europe and North America are now traversed by many lines of railway, and India, Japan, and the southern temperate lands have been opened up by them. The building of trans-continental lines has been of great economic importance. The first across America, the Union Pacific, was opened in 1869, the Canadian Pacific in 1885, and early in the twentieth century Asia, South America, and Australia had each a trans-continental railway, and the Cape-to-Cairo line was in progress in Africa.

The use of electric and other motors is rapidly extending, and has almost taken the place of horse haulage in streets and on roads.

A similar revolution has taken place in facilities of transport by water. A fertile country with a navigable river has always had the advantage of possessing a great natural route. On large rivers, the current can be utilised in descending, but oars and sails, and haulage by men or animals, are still used to propel boats up-stream. On the Amazon the constant up-stream wind blows the craft up the river. On the Yangtse-kiang the boats are hauled up the rapids above Ichang.

The advantage of water transport is great, for much larger quantities can be carried in boats than in wagons. This has led to the construction of canals for navigation, of which the Imperial Canal of China, seven hundred miles long, constructed in the seventh century, is one of the most remarkable. Canals must be level, and until locks were invented in the fifteenth century, they could not be built across very uneven ground without immense excavations. Just before the introduction of railways the canal system

was rapidly extended in our country to facilitate the transport of passengers and goods. Canals are greatly used for inland navigation, especially on the Continent, at the present day; and it is a matter of national importance that our canal system should be reorganised and extended.

The most recent developments of canals are connected with ocean navigation, and consist of (*a*) isthmian canals and (*b*) inland canals. The isthmian canals have been cut to save long detours, and are large enough to permit great ocean steamers to pass through them. The most famous is that of Suez, one hundred miles long, which shortens the journey from England to Bombay by sea by some 4500 miles. Smaller ones cross the isthmus of Corinth and that at the south of Schleswig-Holstein. The central American isthmus has been cut for a canal at Panama. A ship-canal should be cut across the isthmus between the Forth and Clyde to permit more direct communication between many North Sea and all Baltic ports and the ports of the northern United States and southern Canada. The isthmus of Kra will perhaps be pierced to shorten the sea-route from India to the Far East.

The inland canals are too numerous to mention in detail. A simple form of canalisation is to dredge a river and regulate its outflow by dikes. Glasgow was thus converted into a port. In recent years canals have been excavated across the land to make Manchester a seaport, to permit large vessels to pass directly to Amsterdam from the North Sea at Ijmuiden, and to avoid Niagara Falls and other obstacles on the St Lawrence system of waterways,

the most remarkable inland navigable tract in the world.

Coasting traffic has been important from the earliest historic times in the eastern Mediterranean and south-eastern Asia. Oars and sails were used before the application of the steam-engine to the propulsion of vessels revolutionised navigation. Larger and larger ships are now being built; many are driven by oil and lit by electricity. The quicker Atlantic liners travel over twenty-three sea-miles per hour. Steamers ply between the chief ports of the world, and have largely taken the place of sailing-vessels.

For the development of over-sea commerce proper land communications are necessary. (1) There must be harbours where vessels can easily and safely load and unload. These may be natural or artificial. Of the natural harbours, landlocked inlets, island-protected shores, and river estuaries are the most important. The last are exceptionally valuable where the tide regularly rises and falls and permits vessels to sail some distance inland. (2) Behind the harbours must be a productive land. Many of the finest natural harbours in the world, especially on fiord coasts, are of no economic value at present, owing to their having no *economic hinderland*, except where minerals exist in the mountains which rise above them. The economic value of many hinderlands will rise in value with the increased use of water-power for generating electricity. Harbours where the hinderland is a fertile alluvial plain (e.g. Tientsin), a great river-basin where the chief streams are navigable (Rotterdam, Hamburg), or a busy industrial region (Liverpool), are the most important.

The importance of a particular port may wax or wane. We have already mentioned the tendency for the port to be located as near the heart of the industrial region as possible (e.g. Manchester, Cologne, Hankow, Montreal, Duluth, or Chicago replacing Quebec), so as to take the utmost advantage of the cheaper and more commodious ship transport. The other change is the rise of ports as near the land's end as possible (Brindisi, Rimouski) for the transference of passengers, mails, and goods which require to be transported with the maximum speed.

The economic conditions of the world to-day present a great contrast to those of a century ago, owing to the marvellous expansion of cheap and rapid means of communication. In the past, as in some parts of the world at the present, facilities of communication could scarcely be said to exist. Transport was slow, difficult, and dear. In pre-railway years it cost 10d. per ton per mile to transport coal on the backs of donkeys in north-east China. Mr Chisholm states that before the opening of the railway it cost nearly 2½d. per ton per mile to carry coal from Kilmarnock to Troon or Irvine in carts; and that before the Great War it cost ½d. to 1d. per ton per mile to carry coal by train in England, and very much less in the United States.

This cheapening of transport has revolutionised the commerce of the world. In olden times it was not possible to obtain any articles from distant places except those whose intrinsic value was high relatively to their bulk. Thus precious stones, silks, and spices were brought from the East, and gave rise to those exaggerated ideas of the wealth of the Indies, which

stimulated the great discoverers of new routes overseas. Now food-stuffs, raw materials such as wool, and minerals such as coal and iron ore, of relatively little value per unit mass, are freely transported.

Another stage in the growth of commercial relations between the most distant parts of the Earth has resulted from the introduction of methods of preserving perishable goods, by refrigeration, rarefaction, &c. This has greatly increased the available food-supply of densely peopled industrial regions dependent on outside sources for sustenance, and permitted their continuous expansion. It has also led to a growth of trade between tropical and temperate lands which is of great economic significance. The moist tropical regions so prolific of plant life may be made to yield a food-supply immeasurably greater than required by the present population of the world, especially if, as some authorities predict, sugar-yielding foods obtained from fruits gradually become of greater importance than starch-yielding foods derived from cereals, obtained mainly from temperate regions.

The interdependence of mankind has been greatly increased by the development of transport facilities. The intercourse of mankind has also been promoted, not merely by the transference of material commodities, but through the interchange of ideas by means of the telegraph and the telephone, which permit almost instantaneous communication of thought. Wires connect all the great centres of the world, many passing along the beds of the oceans; and it is now possible to transmit messages over immense distances by means of wireless telegraphy and telephony.

CHAPTER VII.

ECONOMIC MAN.

Man as a Producer of Wealth.—In the first four chapters the fundamental distributions with which man has to deal were discussed. In many regions man can live on the spontaneous productions of the earth; but where he relies on these alone, where only hunters and fishers live, the population is scanty. Man must produce as well as destroy, and the modern economic world, with which we have to deal in this book, is composed mainly of producers of wealth. Breeders of stock and cultivators of the ground use the reproductive powers of animals and plants to replenish and increase their stock and produce. They are limited in their distribution by the climate and life-zones described in Chapters II. and III. The manufacturer elaborates crude products into more useful articles. Without easy transport his sphere of influence is local; but with the use of mechanical power in manufacture and transport it may become world-wide.

A volume could profitably be written on the subject of this chapter, a subject not sufficiently considered in many courses on commercial geography. Only three aspects of it can be examined here, and these in the briefest way: (1) the effect of material surroundings on the intensity of man's work; (2) the influence of man's thought and ingenuity in increasing his productive powers; and (3) the effect of human associations in promoting and hindering economic, and especially commercial, expansion.

(1) Varying Intensity of Human Activity due to Material Surroundings.—In calculating the cost of production the intensity of human activity, manual and mental, must be taken into account. Climate and food are two of the most important factors. Education we will consider under another heading. The efficiency of the negro in Africa is much less than that of the white man in Europe. This is not merely a matter of racial difference, nor even a matter of easy satisfaction of the essential wants of food and shelter. The damp heat of the equatorial jungles is extremely enervating; the colder air of our continent is much more stimulating. The northern races in the northern hemisphere are, speaking generally, more energetic than the southern ones, and this is probably due to the influence of cold, which compels action to ensure warmth. To the invigorating effect of winter is due the contrast between the intense activity of the Chinaman relatively to that of the Hindu, in regions where the summer climates closely resemble each other. We can eliminate racial differences by considering the output of an Irish labourer at home and in the United States; and, indeed, contrast generally the greater initiative and energy of the North American of the centre and east compared with his brothers of the same stock in western Europe. It is worth noting that the climatic conditions where the European stock seem to attain their most intense activity are somewhat similar to those where the Asiatic people are most energetic.

A sufficient supply of nourishing food is another factor which is often neglected. The following

account of a contractor's experience in Jamaica is an excellent illustration of the importance of this factor. An American contractor building a railway in Jamaica found Jamaican negro labour excessively dear at one shilling a day, and that Alabama negroes did ten times as much; but a Jamaican negro who secured American food increased in strength until he was as good as the Alabama negroes (see R. T. Hill, *Cuba and Porto Rico*, p. 228).

(2) **Increase of Human Productive Powers due to Increased Thought and Ingenuity.**—It is less necessary to insist on the importance of mental training for economic progress, but it is needful to point out that mental alertness in practical affairs is obtained through dealing with concrete problems. A scientific training is essential for the economic man, who has to deal with the concrete facts of the world. The knowledge of natural phenomena and the development of modern labour-saving methods have grown together.

It is unnecessary to recapitulate these advances here—from the securing of proper shelter and food to the latest developments of wireless telegraphy, experiments in fertilisers of the soil, or attempts to make unhealthy areas healthy. All have a profound economic significance, commonly recognised in the case of mechanical improvements, but too often neglected in the case of biological advances.

We may briefly classify the more important of these applications of human thought and ingenuity as follows: (a) Attempts to increase the natural productiveness of the soil directly by improved drainage and watering, food-supply (fertilisers), and the wider effects of foresting and deforesting; as well

as the more specialised attempts to secure ideal conditions by the use of glass-houses for plants or electric stimulus in the field.

(b) Efforts to secure more useful species of plants and animals by breeding as well as by feeding.

(c) The numerous devices for transforming raw products, animal, plant, and mineral, into manufactured articles by the use of machinery and natural forces.

(d) The special application of these mechanical devices to improved means of communication, either by transference of commodities or of thought.

(3) **Economic Influence of Human Associations.**—This would naturally lead us to consider the different groups of men and their economic efficiency, and the gradual economic transformation that is taking place within each at the present day, which is a subject for an advanced work on economic geography. In the present book we may cite one or two cases of the immediate economic effects of the occupation of a region by a group of men of higher or lower economic efficiency.

For instance, the western plains of Canada and the grass-lands on the southern margin of the Siberian forests were used only by a comparatively few wandering tribes until towards the close of the nineteenth century. With the building of the Canadian Pacific and Siberian Railways a great influx of farmers has taken place, who have settled on farms near the lines, which bring them many necessaries of life, as well as not a few luxuries; and along which they can send the produce of their fields to markets in densely peopled urban centres. The potentialities of this agricultural development existed in these

regions in the days of the wandering Red Indians and Kirghiz, but these tribes were not in a sufficiently advanced state of civilisation to utilise them; they have been pushed aside by a more highly developed people who could. Of course, such changes have taken place both in the past and in the present without the potent aid of modern mechanical means of transport. In Manchuria the nomadic pastoral Manchus have given way before the industrious Chinese farmers, who now form by far the greater part of the population of this prosperous province. This, however, has not affected the world's commerce as the settlement of the plains of North America has done. We may find the converse of this in Mesopotamia, where a flourishing agricultural civilisation was overthrown by pastoral conquerors, and a fertile land temporarily turned into a wilderness. Retrogression is not unknown in the world's history.

In intertropical lands other aspects of recent transformations due to the intervention of a higher economic civilisation can be seen in parts of Africa, where railways have been built, plantations formed, and the fruitful land made to yield not merely enough to supply the modest needs of the relatively few inhabitants, but produce of many kinds sought for by the complex civilisations of temperate lands. The initiative and supervision in this case also have come from Europeans or their descendants. Here the native is not displaced, for he alone can healthily perform the necessary manual labour; but his work is organised by the European, who also ensures the peace without which sound economic progress is impossible, whether in equatorial or temperate lands.

Finally, we have to mention the influence of political groupings and policies in the economic world. With few, and these not perfect, exceptions, political boundaries are barriers to economic circulation—(a) through the tariffs imposed on many commodities crossing them; (b) through the different languages, customs, weights and measures, and monetary systems, which in many cases hamper exchanges. The removal of such boundaries promotes expansion of trade. The unification of the German Empire in 1871 was a potent factor in its economic development. The internal freedom of trade over an area yielding nearly every kind of produce is of first importance in the economic expansion of the United States of America. The policy of Free Trade has been an important factor in the growth of the foreign trade of the United Kingdom to the largest in the world; and the fact that the greater and more compact natural resources of so vast a country as the United States will undoubtedly in time deprive us of the first place need not affect the bulk of our trade, nor is it an argument against the soundness of our policy. The ideally healthiest community from an economic point of view is that which makes the most of its own resources for its own wants, and permits the freest interchange with other communities. Differences in weights, measures, and coinages are unnecessary restrictions; while tariffs must be regarded as temporary expedients, which in some cases may promote local economic development.

PART II.

REGIONAL ECONOMIC GEOGRAPHY.*

CHAPTER VIII.

**BRITISH NORTH AMERICA : CANADA AND
NEWFOUNDLAND.****Physical Conditions.**

Configuration.—The separation of Canada from the rest of North America is purely artificial, but a variety of causes have combined to favour its independent existence. The most important are the great estuary of the St Lawrence, the Great Lakes and other navigable waterways to which it is the eastern entrance, and the fact that the rugged and forested eastern highlands of North America south of the St Lawrence acted, before the construction of railways, as natural barriers, difficult to cross except by two narrow passages up the Hudson and Potomac. Canada consists of the St Lawrence basin, with a great area of wooded hilly land to the north, and of vast grassy, forested, or frozen plains to the west, whither until about 1880 only the fur-trader penetrated. Beyond the plains are the western Cordilleras, a barrier so formidable that, before the construction of the interoceanic Canadian Pacific Railway (C.P.R.),

* The reasons for adopting the following order in the treatment of the Regions of the World are given in the Preface.

communication between east and west was easier by the long voyage round Cape Horn than over the high passes of the Rocky Mountains and the Selkirks.

Economically, as well as physically, Canada consists of three great physical divisions—(1) the mountainous west, (2) the plains of the centre, and (3) the uplands of the east—and in each we have to distinguish between the more temperate south and the colder north.

The **Western Region** is a sea of mountains, forming a great climatic barrier. Three ranges are of special importance—the Northern or Canadian Cascades, which border the coast and arrest much of the rain from the ocean; the Gold Ranges, rich in minerals, in the centre; and the loftier eastern Rocky Mountains, which rise like a huge rampart above the central plains. Except the south of Vancouver Island, all this part of Canada lies north of latitude 49° N., approximately that of Jersey and Paris. Lying in the west of the continent, it is in the track of the westerly storm-winds, and the climate of southern British Columbia may be compared to that of southern England or Ireland. The temperature is never very high nor very low, except in the inland valleys. On the western slopes of the northern Cascades, and on the higher and more exposed western slopes of the inland ranges, the rainfall is very great (about sixty inches a year), especially in winter; but on the lower eastern slopes and in sheltered valleys it is very low (under ten inches a year). British Columbia has, therefore, a great variety of climates. From the mild moist coasts to the snow-covered summits of the mountains, most of the land is densely forested,

leaving only the narrow flood-plains of the rivers available for cultivation. These rivers are the Fraser, Upper Columbia, and its tributary the Kootenay, which here and there form long, narrow lakes where the steep-sided valley slightly widens and flattens. The northern part of this western region is loftier. The St Elias or Sea Alps rise 18,000 or 19,000 feet above the coast, but the inland mountains are lower. The coastal region is always bleak and wet, but the interior is much drier, though extremely cold in winter, and only moderately warm in summer. It is ill fitted for cultivation, and produces only a low scrub. It is drained by the upper waters of the Yukon, known as the Lewes and Pelly Rivers.

The Great Plains gradually descend from the slopes of the Rocky Mountains to the east. They are crossed by many sluggish rivers, and are fed by the snows of the mountains. The surface is broken by low morainic heights, which here and there dam the rivers, causing them to expand into great lakes. The climate is one of extreme temperatures—cold in winter, hot in summer in the south, though, of course, cool in the north. The rainfall is low, and mainly in summer. The cereal crops derive their moisture in spring, not from showers, but from the thawing water in the soil, which has been frozen hard during the severe winter. The dry and warm chinook or föhn winds, known sometimes by the expressive name of 'snow-eaters,' blow in the west from over the Rockies in spring, causing the rapid disappearance of the snow from the surface, and allowing of early grazing.

The forest belt runs diagonally across the plain from south-east to north-west, with grass-land to the south-west, and to the north and north-east the icy desert, or tundra, including the Barren Lands.

East Canada consists of the Laurentian uplands, north of the Great Lakes and the St Lawrence, and the north-eastern part of the Appalachians, including the northern part of the New England highlands and the uplands of Nova Scotia, to which may be added those of the colony of Newfoundland. The climate, while neither so extreme in temperature nor so dry as that of the plains, is still much less mild and wet than that of British Columbia. In the Lake peninsula, in the latitudes of Rome and Turin, the summer temperature is high, and the rainfall is uniform and moderate at all seasons. The east coast is much wetter, with less marked extremes of climate. The waters round the edge of the Gulf of St Lawrence are frozen in winter, but the eastern and southern coasts of Nova Scotia and New Brunswick are not ice-bound. The Labrador Highlands have a very severe climate, and are at present of little economic importance, except for fur-hunters.

Economic Products.

The natural wealth of British North America is very great. Fish abound in its sea and river waters; fur-bearing animals are still numerous on the edge of the tundra and in the forests, which also yield valuable timber; the dry grass-lands of the plains make

fine ranching-grounds, while minerals are very widely distributed.

Fisheries.—The eastern sea-fisheries are the most important in the world. The shallow waters south of Newfoundland and east of Nova Scotia, in the Gulf of St Lawrence and the Bay of Fundy, and off the Labrador coast are the feeding-grounds of innumerable fish. Cod, halibut, mackerel, and herring are caught on the Banks, and lobsters and oysters round the coasts, especially off Prince Edward Island. The populous centres of eastern North America form markets for a portion of this harvest. The surplus fish are either salted (cod), or canned (lobsters), or packed in ice and sent to Europe and the West Indies. Seal and whale fishing is carried on in summer in ships which sail from St John's, Newfoundland.

The valuable sea-fisheries in the western sounds and fiords, where Prince Rupert is now an important centre, include herring, black cod, and halibut. But the river (fresh-water) fisheries are here more important than sea-fisheries. Salmon, which are caught in vast quantities as they rush up the Fraser, Columbia, and Skeena Rivers in great shoals, making for the spawning-grounds, are largely canned for export.

Most of the Canadian rivers abound in trout and other fish. The Great Lakes contain lake-trout, salmon, herring, black bass, and many other species, which are sent in ice to the large cities of the interior.

Furs.—The northern forests are the home of many animals whose thick, furry coats protect them against the inclement winter. The fur-trade has been important for centuries, and still continues to be so. The Hudson Bay Company, formed to trade in valuable

furs, was formerly sovereign over much of the Dominion, but is now only a great trading company. The fur-traders, many of them French or British half-breeds, penetrate the great North-west, and either trap the animals or buy their skins from the red men. Through these fur-traders much of the interior has come to be known.

Lumber.—The great forests of Canada produce excellent timber in immense quantities. Pines yield the most valuable timber, but much of excellent quality is obtained from hard-wood trees such as maple, beech, ash, oak, and birch. Lumbering is carried on in winter, when the frost has hardened the marshes, and the snow furnishes a uniform hard surface over which it is easy to drag the logs to the nearest river. In the following spring these logs are formed into rafts, carried down by the flooded rivers, rowed across the lakes, and deposited finally at saw-mills, which are usually built where water-power can be obtained from neighbouring falls, and where, in addition, railways or ships are at hand to carry away the sawn timber. The Ottawa and the St John are the busiest timber rivers in Canada. At the towns of Ottawa, Hull, and St John lumber is sawn and manufactured into furniture and into agricultural and other implements, or transformed into pulp for paper-making.

In British Columbia the tall Douglas or Oregon pines and cedars are cut and sent across the Pacific as far as Australia, and are even brought to Europe.

Ranching.—The rainfall in many parts of the plains of the far west is too low to permit cultivation without irrigation. In the drier parts of south Alberta the grass grows in isolated tufts. The climate in winter,

however, is 'so mild that stock can be allowed to run at large, and the prairie grasses, gradually cured by the autumn chinooks, are as good food for cattle as they were for buffalo.'

At present about a million acres in Alberta have received irrigation, and projected schemes affect another 750,000 acres. The rancher now raises grain for himself, or saves the freight by purchasing it near at hand.

Farming.—Agriculture is the most important occupation. With the opening of the railways across the western plains it has become possible to send farm products to market, as well as to carry settlers to new centres of cultivation. Thousands of square miles are now under cultivation, and the area of arable land is increasing yearly. Nevertheless, vast districts of the North-west are still unbroken by the plough. Flax is extensively grown, though at present chiefly for its seed, in Saskatchewan.

Wheat is the cereal most cultivated, especially in the rich soils of Saskatchewan, Alberta, and the Red River Valley of Manitoba. Most of the grain is sown in April and harvested in August, when it is thrashed and stored in elevators close to the railway, ready to be transported to the Great Lakes for shipment to Europe. Mixed farming is extending. In the east, where wheat-growing was formerly important, farmers can no longer compete with the settlers on the virgin soil of the west, and little grain is now grown except as food for stock. Dairy and poultry farming is found to pay better, and butter, cheese, and eggs, as well as chickens and turkeys, are exported, preserved when necessary by means of cold storage.

The district round the Bay of Fundy, protected from strong and cold winds, is a great apple-growing region. The Lake peninsula, in the latitude of northern Italy, is famous for its fruits—apples, pears, plums, peaches, apricots, grapes, and many small fruits.

Temperate fruits are largely cultivated in the sheltered valleys of British Columbia.

Minerals.—Canada is rich in minerals, both useful and precious. In the east, Nova Scotia is the most important mineral region, yielding some gold, but being more noted for coal and iron. The richest mineral region of Canada is in the western mountains, where nearly all the precious and useful minerals are found. In the middle of the nineteenth century, when the gold rush took place to the Rocky Mountains, many miners penetrated into the Cariboo district, where they found alluvial gold. This placer gold, as it is called, is becoming exhausted, the present yield being obtained in Cassiar and Cariboo districts. In the Klondike district of the Yukon Territory the quantity of gold extracted from the soil is steadily diminishing.

In other parts of Canada gold is obtained from rocks, of which it forms but a small percentage. If an ounce of gold occurs in a ton of rock, it pays to crush the rock and extract the gold, provided routes exist by which machinery and food can be easily brought to the mining centre. The most important of the quartz gold-mining regions are: (1) West Kootenay, in the south of British Columbia, where Rossland, on the Columbia River, has grown with the development of the mines; (2) the Dease Lake district, in the north of British Columbia; (3)

Ontario, now the first producer, where Porcupine and Kirkland Lake are the chief fields; (4) Nova Scotia.

Silver-lead is found in a wide area to the north of Kootenay Lake, round Thunder Bay, and to the west of Lake Tamiskaming, where Cobalt is one of the richest silver-camps in the world. Nickel is found at Sudbury, in Ontario, north of Georgian Bay. The mines here are among the most valuable in the world. Copper, usually associated with gold, is widely distributed in British Columbia (the Kootenay and Cariboo districts, and on Vancouver and Queen Charlotte's Islands); it is also found along the shores of Lakes Huron and Superior, and on the south side of the St Lawrence. Asbestos is the chief mineral in Quebec, which possesses some of the most valuable deposits in the world.

Canada is exceptionally well provided with useful minerals; their development awaits the extension of transport facilities. Excluding the undeveloped areas of the far north, Canada has nearly 100,000 square miles of coalfields. These may be arranged in four groups—(a) Eastern, (b) Alberta and Saskatchewan, (c) Rocky Mountains, and (d) Pacific Coast.

The coalfields of Nova Scotia, which furnish about 40 per cent. of the Canadian output, are associated with valuable deposits of iron. At Sydney and Inverness, on Cape Breton Island, the shafts of the mines are close to the shore, and the under-sea coal is worked. In the treeless western plains brown coal, or lignite, is widely distributed, especially in the Souris River district, in Saskatchewan, and at Edmonton, in Alberta. At the last-named place and in the Bow River valley valuable deposits of bituminous

coal occur. Canmore coal is employed on the British Columbia section of the Canadian Pacific Railway, and has been tested for use in the United States navy, with satisfactory results. Important and extensive coalfields were opened up in the Crow's Nest Pass through the Rocky Mountains when the branch line of the C.P.R. was laid to the Kootenay district, where the coal, which yields good coke, is used for smelting. Extensive deposits are now being worked in the Brazeau River district. The Rocky Mountains also contain anthracite of good quality, found at Anthracite, on the Canadian Pacific Railway. Vancouver Island is one of the few coal-producing regions of the eastern Pacific, and large quantities are exported from the mines at Comox, Nanaimo, Ladysmith, and Wellington to the western United States, as well as for navy and steamship consumption. Anthracite occurs on Vancouver and Queen Charlotte's Islands.

There is no available coal in Quebec and Ontario, but compensation for this is found in the abundant water-power that can be utilised for electrical energy, and in the extensive stores of crude oil and natural gas of south-west Ontario, especially in Lambton and Kent counties. Oil-fields are yielding in the 'tar-sand' region of Alberta and in the Mackenzie basin.

Coal, charcoal, and water-power ('white coal') are used in smelting Canadian iron ores. The leading iron regions are (1) Texada Island, and the vicinity of Victoria and of Quatsino Sound, Vancouver Island; (2) the Michipicoten deposits, on the east shore of Lake Superior, Ontario; (3) the Moose Mountain district, from which the ores are sent by rail 60 miles south to Key Harbour, on Georgian Bay, and then

shipped to Toronto and Cleveland; (4) the ores of eastern Ontario, to the north of Port Kingston; (5) the deposits of Nova Scotia, which promise to make this province one of the great iron-producing regions of the world.

Large ironworks have been established at Sydney, Cape Breton Island, where the ore is brought to the coalfield from Bell Island, in Conception Bay, Newfoundland, and on the mainland at Pictou, New Glasgow, Londonderry, and Truro, where local iron is smelted with local coal. Steel as well as iron is now manufactured in Ontario, at the Sault Sainte Marie Falls, between Lakes Superior and Huron, and at Hamilton and Midland.

Manufactures.—The principal manufactures of Canada are the elaboration of food products, the making of agricultural machinery and transport material, the manufacture of paper, the weaving of cloth, and the increasing working in metals just mentioned. Except for textiles, india-rubber, and cane-sugar, Canada supplies the raw materials for its manufactures, a circumstance which in some measure determines their character. Most of them have already been referred to in the section dealing with natural resources.

Fish-canning on the Fraser River; flour-milling at Winnipeg, in the centre of the wheat-growing area, and at numerous towns in Ontario; the butter and cheese making which has become so important in the eastern provinces, are all typical examples of manufactures resulting from Canada's wealth of raw materials suitable for food. The abundance of timber has given rise to the industry of saw-milling at numerous waterfalls. With the development of popu-

lation a further stage has been reached, and timber is not merely roughly sawn, but manufactured into implements, furniture, and paper. In other cases the abundance of available water-power has given an impetus to manufactures, for which the raw material, chiefly cotton or wool, has to be imported. A large number of towns in eastern Canada, more particularly in the Lake Peninsula and in southern Quebec, are prosperous manufacturing centres. This most southern, most fertile, and longest-settled part of Canada is naturally the most populous. Without a certain density of population and access to a regular and cheap food-supply, manufactures cannot profitably be undertaken, and this explains the concentration of the manufactures in southern Ontario and Quebec. Nova Scotia and New Brunswick have even better water-power and easier access to coal, but neither, except in the recently started ironworks of Nova Scotia, has at present any considerable manufactures, although these are likely to become important in the future.

St John, Moncton, and Marysville, in New Brunswick, have cotton and woollen mills. In the days of wooden ships, Yarmouth, Nova Scotia, and St John, New Brunswick, were famous for their shipbuilding. Fishing-boats are still built, but the substitution of iron for wood in large vessels has seriously affected their prosperity. The abundance of coal and iron in Nova Scotia may some day lead to a revival of shipbuilding.

Quebec and Montreal, in Quebec, are the most important industrial centres of Canada. The Montmorency Falls, near Quebec, supply power to a cotton-factory, and the city is famous for its leather, boots, and shoes. Leather and leather goods are also manufactured at Montreal, but sugar-refining and the making of railway plant are more important; while the manufactures of apparel, of cottons, india-rubber, tobacco, and malt liquors are also among its industries. Montreal obtains its electrical power

from the Shawinigan Falls, on the St Maurice River, where it descends from the Laurentian Mountains. Here an important electro-chemical establishment and extensive pulp and paper mills have been erected. The industrial centres of Grand Mère and La Tuque have risen at falls farther up the same stream. Ottawa and Hull, at the Chaudière Falls of the Ottawa River, and Three Rivers, are important saw-milling and paper-making centres. South of the St Lawrence, Sherbrook, St Hyacinthe, and Valleyfield make cotton or woollen goods, and Sorel is a steamer-repairing town near Lake St Peter. Toronto is the largest city in Ontario, with saw, flour, and paper mills, breweries, distilleries, foundries, and furniture manufactories. Kingston at the east and Hamilton at the west of Lake Ontario, and Peterborough at the Fifty Feet Falls of the Otenabee River, north of the Lake, London on the Thames, Cornwall on the St Lawrence, Guelph, Brentford, and numerous other smaller towns in the Lake peninsula, manufacture textiles, iron, machinery, and railway plant. The petroleum found in the region round Petrolia is refined in London, Ontario. Shipbuilding is carried on at Collingwood, Port Arthur, and other lake ports.

Means of Communicaton.—Canada has the most magnificent inland waterways of any country in the world, though they are unfortunately frozen during the winter months. The St Lawrence system is by far the most important. Since the river was dredged great ocean liners steam past Quebec through Lake St Peter to Montreal, over 1000 miles from the Atlantic. Between Montreal and Lake Ontario a chain of canals, the Cornwall, the St Lawrence, and the Lachine, renders the St Lawrence River navigable for large lake vessels. The alternative route by the Ottawa River and the Rideau Canal to Kingston on Lake Ontario is of little importance either from the commercial or the strategic point of view. The Niagara Falls bar the passage between Lakes Ontario and Erie, but the Welland Canal is cut across the Niagara

peninsula. From here navigation is uninterrupted as far as the St Mary River, which issues from Lake Superior as a great rapid (the Sault Sainte Marie, locally known as the Soo), at the side of which canals have been cut both in Canadian and United States territory. The recent deepening of these canals to 20 feet permits sea-going steamers to penetrate to the western end of Lake Superior, 2250 miles from the Atlantic.

It has been proposed to shorten the distance between Lake Huron and Montreal by about 300 miles by constructing a ship-canal from Georgian Bay, *via* the French and Ottawa Rivers, to Montreal. The other rivers of Canada have long been used by the Indian or half-breed boatman, who carries his canoe over the short portages from river to river. The upper Columbia and Kootenay Rivers, joined by canal, and the lower Fraser and Skeena, are navigable.

The advance of Canada in recent years has been the result of a great development of the railways, particularly in the west and north-west, greatly facilitating the transport of produce to the lake ports and the seaboard. Canada now possesses three great transcontinental lines. Winnipeg is the focus of the railway systems of the Dominion, and since the beginning of the century its population has been quadrupled, and now numbers 180,000. From Winnipeg the Canadian Pacific Railway from the Atlantic seaboard, through Montreal, Ottawa, Sudbury, Port Arthur and Fort William at the head of Lake Superior, proceeds westwards by Brandon, Moose Jaw, and Medicine Hat; here the line divides, one branch passing Calgary and crossing the Rockies by the

Kicking Horse Pass, at a height of 5344 feet; the other, by the Crow's Nest Pass, traversing a rich mineral district. The Canadian National Railway reaches Winnipeg from its lake terminal at Fort William, and is continued to Edmonton, which is rapidly becoming an important railway centre. From the capital of Alberta the line crosses the Rockies by the Yellowhead Pass (3712 feet), and runs through Fort George and the fertile Bulkley Valley, thence down the valley of the Skeena to Prince Rupert, where a large port has been established on one of the best natural harbours on the Pacific coast. From Winnipeg the National line is continued eastwards through Cochrane and over the bridge at Quebec to the Atlantic coast. This line forms a transcontinental route from Halifax to Prince Rupert, entirely within Canadian territory, and commands much of the traffic of the Dominion which formerly reached the Atlantic seaboard through the United States. A third trunk line of the National system runs to Winnipeg from Port Arthur, where, in addition to extensive smelting-works and shipbuilding yards, some of the largest grain-elevators in the world have been erected. From Winnipeg this National railway reaches Warman by three routes: the first by Brandon, Regina, and Saskatoon; the second by Dauphin and Buchanan; and the third by Dauphin and Prince Albert, from which the new line to Port Churchill, Hudson Bay, is nearly completed. The line next passes through Battleford to Edmonton, and thence over the Yellowhead Pass and down the valleys of the Thompson and lower Fraser rivers to Vancouver, which, by utilising the short route

of the Panama Canal, has now become an important outlet for the grain of the western plains.

The innumerable branch lines have played a large part in opening up the agricultural areas of the west. Railways cross the artificial frontier between Canada and the United States, and thus link up the two systems; the steamers on the Great Lakes call at ports in both countries. A tunnel has been cut beneath Lake St Clair at Sarnia, and huge ferries carry the trains from Windsor to Detroit, and from Grand Haven to Milwaukee, at all seasons of the year. The Niagara River is bridged, and also the St Lawrence at Montreal and Quebec. A canal follows the Richelieu River to Lake Champlain and the Hudson Valley. The line under construction from Saskatchewan to Hudson Bay (p. 72) will relieve the railway congestion at harvest time, and bring the prairies nearer Europe; but the short season during which Hudson Strait is not icebound renders the financial success of the scheme somewhat doubtful. Aeroplane observations indicate that the duration of the open season has been underestimated.

The Canadian transcontinental lines not merely unite the provinces of Canada, but form important links of communication between Britain and other parts of the world. The distance from Montreal to Vancouver is 400 miles shorter than that from New York to San Francisco; it is nearly 1000 miles less from Liverpool to Japan and China by the Canadian Pacific than by the United States route, and this distance has been further reduced by 500 miles by the completion of the Grand Trunk line and liners to Yokohama from Prince Rupert. At present steamers ply regularly

between Vancouver and Japan and China, and the mails are carried from London to Yokohama by Canada in half the time they took by the Suez Canal. The Canadian route, however, is rivalled as a mail route to the Far East by the Great Siberian Railway, as the latter is the shortest route from Britain to Japan.

In summer Montreal is the terminus of the Atlantic liners which call at Quebec. The mails are taken up and landed at Rimouski, nearer the mouth of the St Lawrence, from and to which they are despatched by rail. From November to May the St Lawrence is blocked by ice, and Halifax or St John becomes the winter port. Some Canadian traffic is also carried on through Portland, Maine, and Boston, Massachusetts, in the United States.

The Internal Trade.—The internal trade of Canada is very great, and with the rapid increase in population is steadily expanding. All manufactured articles are made or imported by the eastern centres, and sent to the western plains in exchange for cereals. Coal from the Rocky Mountains is sent eastward as far as Regina, beyond which United States coal, brought across the Great Lakes, is found to be cheaper.

External Trade.—The exports of Canada are mainly wheat and flour, forest products, dairy products, fish, fruit, minerals, and cattle. Canada can supply itself with most temperate products, but imports those of subtropical and tropical origin. These are largely food-supplies—more particularly sugar, tea, and coffee—and raw materials, especially cotton, wool, and rubber. Because home supplies of coal lie far distant, many parts round the Great Lakes find it cheaper to import United States coal, which not only finds a market in Ontario and Quebec, but reaches as

far as western Manitoba, where it competes successfully with coal from Alberta. The bulk of the imports, however, are manufactured goods, including textiles of all kinds, and iron goods.

About one-third of the revenue is obtained from duties levied on imports, which fall most heavily on luxuries. The duties on other commodities vary in proportion to their nature and value. Most raw materials and a large proportion of partially manufactured articles and foods are admitted duty free. A preferential tariff is applied to goods brought in from the United Kingdom and parts of the British Empire. An intermediate tariff is applied to *bona fide* products of countries entitled to participate.

The external trade of Canada for the period 1920–1922 amounted to £420,000,000 per annum, of which almost one-half consisted of imports. The countries with which Canada trades most are the United Kingdom and the United States. During the three years ending 1922 the average annual trade with the home country exceeded £102,000,000, over three-fifths being export trade. The trade between Canada and the United States is rapidly increasing, partly owing to the large number of American immigrants. In 1920–1922 it had an average annual value of about £290,000,000, of which seven-tenths consisted of imports. The leading exports are: to the U.K., vegetable produce; to the U.S.A., wood, wood products, and paper. From the U.S.A. iron and its products are the chief imports, from the U.K. fibres and textiles.

Newfoundland.—The whole island of Newfoundland is rich in minerals. Important iron ore deposits occur on the west coast and on Bell Island, in Conception

Bay. Coal is found in the neighbourhood of St George's Bay and in the Grand Lake district. The output of copper is becoming more valuable. Gold, silver, and lead are found. The fine pine forests supply timber in increasing quantities. The island is threaded by rivers, widening here and there to great lakes, and rich in fish. At Grand Falls and Bishop's Falls extensive pulp and paper mills have been erected, which supply the paper for some of our British newspapers. The climate is cold and moist. Hay, oats, barley, and root-crops are the chief agricultural products.

Fishing is the most important industry, not, however, in the inland waters, but on the Great Bank which lies to the south. Over £5,000,000 worth of fish are exported annually to the United Kingdom, Portugal, Brazil, United States, and Canada.

The railway runs from St John's across the island to Port aux Basques, which is within a six hours' passage of Sydney, in Cape Breton Island, and the Canadian railway system. Branch lines have been constructed to Bonavista, Trepassey, Heart's Content, and Grate's Cove.

CHAPTER IX.

AUSTRALASIA.

THE economic conditions of British Australasia resemble those of southern Canada in many respects. Australia lies nearer the equator than Canada. The extreme south of the North and all the South Island of New Zealand and Tasmania extend south of 40° S.—that is, into latitudes corresponding with those of the Lake peninsula of southern Canada. The North

Island of New Zealand and southern Australia form a transition from these cool temperate to the intertropical conditions which characterise northern Australia.

NEW ZEALAND.

The Dominion of New Zealand consists of two large islands, the North and South (sometimes called the Middle) Islands; the smaller Stewart Island, to the south of the latter; and a number of distant and smaller dependencies, with the mandated Western Samoa.

The South Island.—The South Island, popularly described as the antipodes of England, lies in the latitude of Italy north of the Gulf of Taranto, but owing to its insular position in the water hemisphere (see page 16), it enjoys a cooler and more equable climate, resembling that of southern England in the extreme south, and that of the west coast of France in the north.

The most important physical feature is the western mountain-range—the Southern Alps—which traverses the island from south to north. This range, which rises to the height of 12,349 feet, is of economic importance not merely as a barrier to communication, but because of its influence on the rainfall of the island. The brave west winds striking against this lofty barrier are deflected upwards, causing heavy rains on the western or windward slopes. On the eastern or lee side they descend as warm, dry winds, resembling the chinooks of Canada (see page 60), and shake the ears from the too rapidly ripened corn. The rainfall of the South Island, therefore, presents a general resemblance to that of Great Britain.*

* See *Commercial Geography of the British Isles*, p. 18.

The western slopes of the Southern Alps are covered with dense forests. Pines, cedars, and zimus are the principal timber-trees cut for sawing. Cattle are fed on the forest undergrowth in the lower regions, but the upper mountain pastures are scarcely used. The eastern portion of the island is pasture-land, on which sheep, cattle, horses, and other stock are grazed. The value of the plains is being greatly increased by irrigation, and wheat, oats, barley, grass, clover, and root-crops are cultivated, wheat and oats being the most important. Sheep-rearing, however, is the chief occupation, especially on the Canterbury plains, which produce the famous Canterbury mutton and lamb, in which a large export trade is done.

The South Island, therefore, somewhat resembles British Columbia in its economic condition. It is essentially a pastoral country, with coal and a little gold mining. Agriculture is developing in the clearings of the eastern mountains, and fruit-growing has been extended in the Nelson Land district.

The North Island lies in latitudes corresponding to those of southern Portugal and northern Morocco. The mountains are lower and less continuous than those of the South Island, and are volcanic. The surface is irregular, and the quality of the soil varies greatly from district to district, fertile volcanic and alluvial soils alternating with barren clays.

The northern part lies in the summer track of the trade-winds, but elsewhere the climate resembles that of the southern island except that it is warmer.

The south and south-west, with good soil and heavy rainfall, are forested. Where the forests have been

cleared excellent grass-lands are formed on the hill-sides, and agricultural lands in the valleys.

In the south-west and centre cows are kept, and butter and cheese are made. The south consists mainly of forests or grass-land. The east, with a low rainfall, has rich grass-lands on which millions of sheep are fed. In the north the rain falls in winter and spring. Mediterranean fruits of all kinds flourish, such as the vine, olive, orange, lime, and lemon, as well as fruits of more temperate lands. Forests of kauri, rimu (red pine), and kahikatea (white pine) are conserved to yield valuable timber. Kauri-gum an ingredient of most varnishes, is also important. It is obtained after burning the forest, a reprehensible practice, or dug in a fossil condition. The broad leaves of New Zealand flax, or phormium, supply strong fibres, which are made into rope, mats, and other articles.

Minerals.—In the South Island gold and coal are the chief minerals. Both alluvial gold and reef gold are mined, about 80 per cent. of the total output of New Zealand being derived from quartz-mines. The main sources of supply are at Reefton, near Westport; near Hokitika and in most of the Westland rivers; and in the valley of the Clutha River, Otago. The chief coal-field of New Zealand is at Westport; valuable deposits occur at Greymouth, and at Brunner and Blackball, in Westland. Lignite is found at Green Island and Milton, in Otago. Some silver is also mined.

In the North Island gold, coal, and petroleum are obtained. Auckland has the richest goldfields in the Dominion; gold-yielding quartz is found in the peninsula east of Hauraki Gulf, especially at the famous Waihi Mine, and is crushed chiefly in the Thames

county. Some coal is found at Kawakawa, to the north of Auckland, at Huntly on the Waikato River, and in the Mokau valley, in Taranaki. Deposits of petroleum near New Plymouth have not been successfully developed.

Routes and Trading Centres.—The chief towns of New Zealand are ports. Invercargill and Dunedin in the south, Lyttelton and Timaru (the outlets of the Canterbury plains), Hokitika, Westport, and Nelson are in the South Island; and Wellington, Wanganui, Napier, and Auckland in the North Island.

The railways in the South Island run from Invercargill through Dunedin, Oamaru, Timaru, Christchurch, and Lyttelton, its port, to Mackenzie, with numerous branches. A line runs from Christchurch through Arthur's Pass to Greymouth. There are short coastal lines from Hokitika, Westport, Nelson, and Blenheim.

Two roads cross the Southern Alps, one from Hokitika to Christchurch, the other from Westport to Nelson and Blenheim.

In the North Island a railway runs from Wellington to Napier, on the east coast, and through the western half of the island to Mareretu, near Kaipara Harbour, in Auckland. Branches run to the Thames valley, the picturesque volcanic lake districts in Rotorua, and along the south-west coast to New Plymouth. There are short lines from Dargaville, Kawakawa, and Whangarei, in Auckland, and from Gisborne, on Poverty Bay.

The coasting traffic is important, and counteracts to a great extent the disadvantages of the disconnected railway system.

Trade.—The number of factories in New Zealand is steadily increasing, chiefly in connection with the pastoral industries. Meat-freezing and butter and cheese factories are widely distributed. Saw-milling is an important industry, and woollen and flax mills are extending. Fruit-canning is growing in importance. Wool, frozen meat, butter and cheese, sheepskins and tallow, preserved milk, gold, grain, kauri-gum,

and sawn timber are the chief exports. The imports consist largely of textiles and wearing apparel of all kinds, iron goods, sugar and tea, alcoholic drinks, books and stationery. Two-thirds of the trade is with the United Kingdom and Australia. The rest is mainly with the United States, Fiji, India, and Ceylon.

TASMANIA.

Physical Conditions.—Tasmania lies in the same latitude as the northern half of the South Island of New Zealand, which it resembles in its climate and products. It is a mountainous island, the chief plains being in the basins of the Macquarie and Derwent. The climate somewhat resembles that of south-western England. The rainfall is very heavy in the west, where the land is forested, and occupied only by a few miners and prospectors. In the north and east the rainfall is less.

Economic Productions.—The area of grass-lands is restricted by the extent of the forests, where eucalyptus and pine abound. Cultivation is confined to the valleys. Most cereals are grown south of the Tamar estuary. Potatoes and other root-crops are widely cultivated, especially in the north-west. Temperate fruits of all kinds do well, and apple-orchards are numerous in the south. Grapes are cultivated for wine in Maria Island, in the east. Sheep are the most important stock, the mild winters allowing them to remain in the open all the year round. Dairy produce is now exported.

The mineral wealth is considerable, but not yet fully exploited. Tin is found in Mount Bischoff, in the west, and smelted at Launceston, on the Tamar. Gold

is widely distributed, and is mined in Mathinna district; at Mount Lyell, near the west coast; and at other centres. Silver is mined on the west side of the island, between the Pieman River and Macquarie Harbour. Copper is found in the same area, especially at Mount Lyell, and is smelted at Queenstown. Osmiridium deposits are profitably worked in the bed of the Savage River. Coal for local use is mined at the Cornwall and Mount Nicholas collieries.

Manufactures are in a rudimentary state, and entirely devoted to utilising local raw material. Saw-mills, jam-factories, and other workshops have been started.

Means of Communication.—A considerable coasting trade is carried on, and regular lines of steamers run from Hobart, in the south, and Launceston, in the north, to Victoria and New South Wales, New Zealand, and the United Kingdom. A railway runs northwards from Hobart, through Launceston, to Branxholm. There are branch lines down the South Esk valley, past the Fingal coalfield, to St Mary's, and to Glenora and Apsley. From the main line near Perth a branch crosses the agricultural regions of Westbury and Hamilton, follows the Mersey valley to the north coast, and at Burnie turns south-west through a rich mineral district to Pillinger, at the head of Macquarie Harbour.

Trade.—The exports are minerals—copper, gold, silver, and tin—wool, fruit, timber, and potatoes.

The imports are clothing, machinery and hardware, tea and sugar. The trade is mainly with Victoria, from which Tasmania is distant only 120 miles, New South Wales, and the United Kingdom.

THE ISLAND OF AUSTRALIA.

Position and Configuration.—The continent-island of Australia lies between 40° and 10° S. (cf. Lisbon to Sierra Leone, Baltimore to Trinidad). It is a compact island, broken by few bays. The west is a low plateau, above which rise numerous ranges. The east consists of mountains, with steep slopes to the coast and gradual slopes to the interior. These mountains are lower, wider, and more irregular in Queensland than in New South Wales and Victoria, where they act as important barriers. A band of low ground, scarcely reaching above 1000 feet in the highest part, stretches across the island south of the Gulf of Carpentaria, which may be regarded as a submerged northern continuation of this lowland. In the south, the Gawler, Flinders, and Stanley Ranges rise above the plain.

The eastern coast north of the tropic is fringed by a great coral barrier reef, which forms a huge natural breakwater, 1200 miles long. The entrances across it are usually opposite the river-mouths, but navigation inside it, while smooth, is somewhat dangerous, owing to the existence of innumerable islets.

Climate.—Australia stretches almost as far north as south of the tropic. Most of it, therefore, lies in the trade-wind region. In the centre of the continent considerable extremes of temperature are felt, both the daily and the annual range being great. In the south it is cool in winter, especially on the higher lands, where snow sometimes falls; but in the north it is hot throughout the year. The trade-winds are laden with rain, which falls abundantly on the east coast, espe-

cially during the summer months, but they precipitate most of it on the eastern mountains, and the centre and west of Australia are often rainless for long periods. When rain does fall, it is in heavy torrential thunder-showers, which do as much harm as good. The south lies in the winter track of the stormy west winds, and receives most of its rain at that season. The north has the sun overhead at noon in the summer months, during which it is in the equatorial rain-belt.

The rainfall of Australia, therefore, is confined to the north, east, and south coasts; the west coast is comparatively dry, and the centre is almost rainless. The rainfall varies greatly from year to year. In some years damage is done by floods, while in others millions of animals perish through drought. The rivers vary greatly in size at different seasons, some drying up altogether except during and after the rains.

The following table shows the number of sheep that can feed on a square mile of land in regions with different rainfalls :

Inches of rain	8-10	13	20
Sheep per square mile... ...	8-9	96	640

It is easy to see how great a loss may have to be borne by a stock-raiser in a district where the average rainfall is fifteen inches, if during one or more years the precipitation falls to twelve inches or under.

From official figures for South Australia, it is calculated that the yield of wheat per acre is about six bushels less than the number of inches of rainfall in the winter six months, so that if this rainfall

is eighteen inches the yield will probably be twelve bushels per acre. With the extension of cultivation into the drier parts of the colony, the average yield has diminished, except on irrigated lands.

Economic Divisions.—The economic divisions are dependent on the rainfall. It is necessary to distinguish (1) the practically unproductive desert; (2) the southern strip moistened by winter rains; (3) the regions of summer rains in the east; (4) the hot, wet, tropical regions of the north.

The Desert.—Much of the desert is covered with prickly scrub. Towards its edges is the salt bush, on which a few sheep can be fed. Most of its vast area is, however, wholly unproductive, except where irrigation is possible, when almost anything can be grown. The centre of South Australia and a very large portion of Western Australia are desert. The only inhabited parts are the goldfields (see pages 90, 91).

The Southern Region of Winter Rains.—The extreme south-west of Western Australia between Perth and Albany, the extreme south of southern Australia east of Spencer Gulf, Victoria, and the extreme south of New South Wales all lie within this region, which is the most temperate part of the continent, and best suited to settlers from the United Kingdom.

The colony of Victoria, the smallest and most southern of the Australian states, lies entirely within this region, and is typical of a country with a Mediterranean climate and productions in an early stage of economic development.

Victoria has approximately the area of Great Britain, and lies south of 34° S. It is traversed by a range of mountains running from east to west parallel to the

south coast, which is indented by the great bay of Port Phillip, dividing the southern coastal region into two parts, of which the eastern is called Gippsland.

The north-western flat land between the Murray River and the mountains receives little rain. The mallee scrub, which once covered it, is now cleared, and the surface is broken by a plough which rises over stumps in the ground. Wheat is grown, but the most valuable parts are orchards or farms, irrigated by the waters of the Murray River.

The rainfall is greatest on the southern slopes of the mountains, which are covered with forests, but are less fertile than the northern slopes, which face the sun. Gippsland, receiving both winter and summer rains, is a well-wooded and rich pastoral region.

The characteristic products of warm temperate lands with winter rains do best on the northern slopes of the mountains. Wheat, the most important crop, and oats are grown in the upper valleys and slopes, while on the northern plains maize can be cultivated. Fruit of all kinds, including the apricot, peach, fig, olive, orange, and especially the grape, is grown in the Murray, Goulburn, and other valleys, especially where irrigation is possible. In the irrigated region of Mildura, along the banks of the lower Murray, much fruit (akin to that of southern Europe) is grown and dried.

The yield both of cereals and fruits varies from year to year with the rainfall.

The principal occupations are agriculture, the raising and fattening of live stock for the market, dairy-farming, mining, and lumbering.

The southern part of South Australia resembles Victoria in its winter rains. The crops are sown when

the autumn rains begin, and are harvested in the spring. Some excellent white and hard-grained wheat is raised, but the yield varies with the rainfall; extensive irrigation schemes are in project, especially in the valley of the Murray River, where already much of the cultivated area in the Renmark district is irrigated land. Mediterranean fruits are grown. Towards the north and west the country becomes too dry for agriculture, which is replaced by sheep-rearing. Frozen rabbits are exported in considerable quantities.

The south-west of Western Australia resembles South Australia and Victoria. Considerable forests exist, which produce sandalwood and the hard jarrah and karri timbers, suitable for all kinds of paving and engineering work. Sheep, cattle, horses, and pigs are reared, the main drawback being the frequent droughts and the presence of poisonous plants. Within recent years the State encouragement of immigration and the promotion of railway and irrigation schemes have done much to develop the resources of the country. The area under wheat cultivation is steadily extending, and the yield has increased from less than a million bushels in 1902 to fourteen millions in 1922. Hay is also an important crop, and oats and barley are raised. The number of orchards is increasing in the south-west, and considerable quantities of fruit, mainly apples and grapes, are annually exported.

The Eastern Region of Summer Rains includes the eastern parts of New South Wales and Southern Queensland. Above a narrow eastern coastal plain the mountains rise in steep escarpments, sloping more gently on the west towards the interior. Heavy rain falls on their eastern slopes in summer, but the precipitation

gradually diminishes towards the west. Maize and sugar are the most important crops, but many subtropical fruits are grown. Between Sydney and Newcastle grapes and oranges flourish, but farther north the winter is too short for the vine to have a sufficiently long resting period, and the rains usually begin before the vintage is complete, even in the less rainy region west of the eastern mountains. Tobacco, cotton, arrowroot, pine-apples, and other fruits are also grown, especially towards the northern limit. At the eastern rim of the plateau, where the rainfall is more copious, a considerable amount of wheat is grown, especially in the south; and oats, barley, rye, millet, and other cereals are produced both for their grain and for their straw. Farther west the grassy downs feed millions of sheep, reared chiefly for their wool; New South Wales possesses about 50 per cent. of the total number of sheep in the Commonwealth, the famous merino sheep supplying the best wool in the world. Horses and cattle are reared in smaller numbers, but the chief cattle-rearing region is found along the moister coastal plain of Queensland, as far north as the Fitzroy River. In New South Wales wheat-growing is increasing in importance in the southern part of the western slopes and in the Riverina district, although the yield per acre is low. Where irrigation is possible, agriculture is developing. Numerous artesian wells have been sunk, especially in Queensland.

Dairy-farming has developed considerably in New South Wales in recent years. It was formerly confined to the southern coastal region, but the milder climatic conditions of the north, allowing the cattle to remain

in the open throughout the winter, the generally greater rainfall, and the lower cost of land have encouraged the rapid expansion of the dairying industry in the coast district north of the Hunter River. Large quantities of Australian butter are annually exported, mainly to London, where it enters into competition with the dairy produce of Sweden and Denmark.

The Northern Hot, Moist Tropical Regions.—Northern Queensland is typical of the hot, moist, densely wooded part of Australia. Rice, sugar, bananas, coco-nuts, mangoes, coffee, cotton, and other tropical products are raised. Sugar can be grown in the rich soil of the hot and moist coastal plain, the principal areas of cultivation lying round Mackay and Cairns, north of the tropic, and round Bundaberg and Grafton, south of it. The industry was formerly carried on with Kanaka labour, obtained from the adjacent Pacific islands; but since 1901 the importation of coloured labour has been prohibited, and a bounty has been paid upon every ton of sugar grown by white labour. As a result the production of Australian sugar has been more than doubled, but it is still necessary to import annually over 100,000 tons to supply the growing requirements of the Commonwealth. In 1921 over 4000 tons were exported overseas.

Sheep and cattle are reared along the Flinders and Cloncurry rivers. Queensland contains the largest number of cattle in the Commonwealth.

The northern portions of Northern Territory and of the Kimberley Division of Western Australia are similar in climate and products to northern Queensland, except that the rainfall is hardly so

great and decreases towards the west and south, and that the forest-land does not stretch so far inland.

Northern Territory has an area of over half a million square miles, but its population, excluding aborigines, is just short of 4000, of whom nearly two-thirds are Europeans.

Agriculture, owing to lack of suitable labour, poor communications, and the varying rainfall, is so far unimportant. Tropical fruits, cereals, such as maize and rice, cotton, tea, coffee, tapioca, and tobacco could be grown were cheap labour available. Wherever a sufficient supply of water is available, the tableland, that rises from the coast, is suited for stock-raising.

Australian Minerals.—The discovery of rich placer gold mines from 1850 onward led to a great influx of gold-seekers to Victoria and New South Wales. Later, gold attracted immigrants to Queensland, and in recent years to Western Australia. In Victoria the chief gold-centres are round Bendigo, Beechworth, and Ballarat. The gold is now mainly obtained from quartz. Gold is less important in New South Wales, where it is mined chiefly at Cobar and Adelong, the latter in the upper Murray basin. The Queensland gold-mines are very important in the centre, where the famous Mount Morgan mines exist near Rockhampton; in the south, round the Gympie; and in the north round Charters Towers, Ravenswood, Cloncurry, Etheridge, and Woolgar. Gold is widely distributed in Western Australia, in the Kimberley district in the north, and in the Murchison and other goldfields in the west. The greatest development, however, has taken place in the south, round the East Coolgardie

goldfields, the Mount Margaret district to the north-east of Coolgardie, and the Murchison district farther west; the chief centres are Kalgoorlie and Coolgardie, Malcolm and Laverton. Food and water are scarce in these desert regions, the rainfall being usually less than ten inches, and the gold is expensive to extract; but the opening of railways and the pumping of water from the Helena River, twenty-three miles from Perth, have improved the economic conditions.

Silver is found in many parts of the continent. The most important mines are in the Stanley Range, in the west of New South Wales, where the town of Willyama has grown up round the Broken Hill. Considerable quantities are also found at Chillagoe near Cairns, in northern Queensland. In both these regions a little tin is mined.

The most important copper-mines are found in northern Queensland, the chief centres being Cloncurry, Mount Morgan, and Etheridge. The production of copper is the leading mineral industry of South Australia, the most valuable mines being at Moonta and Wallaroo; the ore is smelted at Port Pirie and Wallaroo. In New South Wales copper is decreasingly mined round Cobar.

The most important coalfields in Australia are those of New South Wales, extending in a semicircle from Newcastle, westward to Lithgow, to the neighbourhood of Bulli in the south. This area furnishes about 70 per cent. of the total output from the Commonwealth. From Sydney and Newcastle large quantities of coal are exported to other states in the Commonwealth and also to foreign countries, especially to the Pacific states of South America. In Queensland con-

siderable quantities of coal are obtained near Ipswich, which has become a manufacturing centre of some importance. Small coal-basins occur near Cooktown, Townsville, and Clermont. Extensive deposits are known to exist in the valley of the Fitzroy River. In Western Australia coal is mined near Bunbury, on the river Collie. In Gippsland there are great deposits of brown coal, in some places over 800 feet thick; a State mine has been opened up at Wonthaggi. Small deposits of rather poor coal are also found at Leigh Creek, in South Australia.

Ironstone occurs at Chillagoe and Rockhampton in Queensland, and at Iron Knob in South Australia. Hitherto the ore from the South Australian mines has been smelted at Port Pirie with coal imported from New South Wales; but iron and steel works have been established near Newcastle for the purpose of utilising the ores from Iron Knob.

Opals are found at Lightning Ridge, near Walgett, and at Ballina, in New South Wales, and in South Australia. **Sapphires** are obtained in central Queensland. **Diamonds** exist in New South Wales, and **pearls** are obtained by divers off the northern coasts.

Australian Manufactures.—The population is still too small and widely scattered to permit of a great development of manufactures. In Victoria and New South Wales, where population is densest, manufactures are most developed. The number of hands employed is about the same in each state, and in both the making of textiles and clothing, of metal and machinery, and the preparation of foods and drinks, rank first, followed by the manufacture of wood, transport materials, paper, leather, and leather goods.

The preservation of food for export is everywhere an important industry. The elaboration of dairy produce is important in the south and east, and sugar-refining in the north. Saw-mills are numerous both in the east and in the south-west. The other manufactures are concentrated in the larger towns, more particularly in Melbourne and Sydney and the other capitals; Geelong (woollen manufactures), Ballarat, and Bendigo (transport materials) in Victoria; Newcastle and Lithgow (iron and steel works) and Maitland in New South Wales; Ipswich (railway stock), Maryborough, and the sugar-producing towns of Queensland; Gawler (flour-mills and engineering works) in South Australia. Shipbuilding is carried on at Sydney, Williamstown (Victoria), and Adelaide.

Means of Communication.—Australia, unlike Canada, is deficient in waterways, and the coasting traffic is much more important than that by river. Several of the eastern rivers are navigable for short distances. The Murray and the Darling are both navigable by light-draught steamers in the rainy season, the former to Albury, the latter to Bourke, but communication with the sea is prevented by the sand-bar at the mouth.

The railway system of Australia is gradually being extended, but the different gauges adopted for the lines in different states involve break of bulk at the frontier. A Royal Commission (1921) advocated the standard 4 ft. 8½ in. gauge for Australia, and the relaying of the lines between Brisbane and Fremantle not on that gauge. From Adelaide the railway runs to the Broken Hill mines, and northward to Oodnadatta. In New South Wales lines connect the eastern Murray

basin with Sydney and Newcastle. From Brisbane the line passes northward through Gympie and Maryborough to Rockhampton. A branch runs westward from Brisbane through agricultural centres as far as Charleville and Cunnamulla on the Warrego River. Two other lines run due westward to the centre of Queensland, the one from Rockhampton through Emerald to Longreach and Emmet, the other from Townsville through Charters Towers to Cloncurry district. Numerous smaller railways have been built from several ports, such as Mackay, Bowen, Cairns, and Cooktown, through sugar-growing regions to the mines. The railway network is densest in Victoria. In Western Australia the lines radiate from Perth northward to Geraldton, and thence to Nannine, on the Murchison goldfields; eastward through Yilgarn to Kalgoorlie, Coolgardie, Menzies, Laverton, and other mining centres; and southward to Albany on King George Sound, and to Busselton on Geographe Bay. From Kalgoorlie the railway has been extended eastward to join the South Australian system at Port Augusta, thus providing a continuous line from Perth to Queensland, with a total length of over 3500 miles. A short line runs inland from Darwin (formerly Palmerston), in Northern Territory; it is proposed to continue this line southward to join the line from Adelaide, and thus provide a second transcontinental line. Electrification of the Victorian railways has begun.

The **Australian Commonwealth** includes six states: New South Wales, Victoria, Queensland, South Australia, Western Australia, and Tasmania, with the Northern and Federal Territories. Throughout the

Commonwealth uniform customs duties are imposed, and all interstate trade is free. Australian industries are protected by tariffs, but a preferential rate applies to goods produced in and shipped from the United Kingdom, and reciprocal tariffs have been arranged with parts of the British Commonwealth. The seat of the Federal government has been established at Canberra, in the Federal Territory, situated south of the main railway line between Sydney and Melbourne, with a port at Jervis Bay.

Trade.—Wool, wheat, and gold are the most important exports from Australia, followed by animals and animal produce (including hides, skins, meat, and tallow), dairy produce, copper, lead, and coal. The leading imports are metals and metal goods (including machinery, railway stock, and agricultural implements), textile fabrics and apparel, foods and drinks, drugs and chemicals, paper and books. The bulk of the trade is carried on with the United Kingdom, which supplies over 50 per cent. of the imports to Australia, and takes nearly 50 per cent. of the exports. The British Commonwealth supplies about 15 per cent. of the imports, and takes 20 per cent. of Australian exports. Among foreign countries the chief customers are the United States, France, and Belgium; except in the case of the United States, the exports to these countries considerably exceed the imports.

In 1922 New South Wales had 40 per cent. of the international trade of the Commonwealth, Victoria 31 per cent., Queensland 11 per cent., South Australia 10 per cent., and West Australia 7 per cent. British weights, measures, and coinage are used. [The statistical tables at the end should be consulted.]

CHAPTER X.

SOUTH AFRICA.

AFRICA south of the Congo-Zambezi divide lies between the same latitudes as Australia north of the Murray and Murrumbidgee. It is much narrower and much higher. Except north of Delagoa Bay, the coastal plain is very narrow, and most of the land lies above 3000 feet. It is a plateau land, bordered by lofty mountains only in the south-east.

The climatic conditions are similar to those of Australia south of the tropic. A small region of winter rains exists in the south-west, which may be compared with the south-west of Western Australia. In the east there is a narrow strip of land receiving a considerable rainfall in summer. The rainfall gradually diminishes from the top of the eastern escarpments towards the west. The climatic differences are that, owing to its greater elevation, South Africa has a lower mean temperature and colder nights and winters than Australia, and that, owing to its smaller breadth from east to west, the desert area is much less extensive. North of the tropic the temperature conditions resemble those of northern Australia; but the rainfall is lower, owing to the presence of Madagascar on the east, and the absence of sea to the north.

South Africa is therefore not so favoured as Australia. It has no equivalent for Victoria and the southern part of the east of New South Wales. The region with more than forty inches of rain, suitable for subtropical and tropical cultivation, is smaller; but

the area with over ten inches, where stock can be kept, is proportionately as great as in Australia. The variations of rainfall and the frequency of droughts are as great as in Australia.

Economic Divisions.—The natural economic conditions also resemble those of Australia. The west of the Cape of Good Hope Province, Bechuanaland, and the South West Africa (Mandate) Territory are practically semi-desert regions, though in parts the land can be stocked with cattle and sheep. Underground water exists, and the land may be rendered productive by irrigation, on which any agricultural or fruit farming developments must depend.

The **South-western Region of Winter Rains** is more limited than in south-western Australia, extending, roughly speaking, from the Orange River to Mossel Bay. This is the wine-producing part of the Cape Province, in which all Mediterranean fruits except the olive can be cultivated. Vines flourish best on the slopes of the Table and Drakenstein Mountains. Wine and brandy are both manufactured, especially at Paarl. The flat lands produce cereals, Malmesbury being the centre of the wheat-farming region. Oats and barley are cultivated in the same district. Fruit (the cultivation of which is developing rapidly) and vegetables also do well, but the supply of agricultural and farm produce is not sufficient to meet local demands.

The coastal region, the Lange and Outeniqua Mountains, and the Little Karroo behind receive about as much rain in summer as in winter. The rainfall is greatest on the southern slopes of the mountains, where half of the few forests of the Cape Province are found in the Knysna region. Yellow

and stink woods, the chief timber-trees, are felled in autumn, the former for railway sleepers, the latter for carpentry, furniture, and wagon-building. The eastern half of the Little Karroo has a limestone soil, which favours the growth of tobacco round Oudtshoorn. Irrigation works are being completed in the Breede and Fish River districts.

At East London the Region of Summer Rains begins. Some forests exist in the south-east of the Cape Province, but they are less important than those in Natal, where, however, they have been too indiscriminately cleared. Yellow, stink, sneeze, and iron woods are the most important trees. Orchards are numerous. The coastal region of Natal resembles that of northern New South Wales. Sugar, tea, and maize are the chief crops on the coastal plains. The output of sugar was more than doubled from 1910 to 1922. In the higher 'midland districts,' corresponding to the edge of the plateau in New South Wales, wheat, barley, oats, and rye are cultivated. This region favours the growth of the black wattle, a native tree of south-east Australia, which yields a valuable bark for tanning, the export of which, along with bark extract, has increased in value from £5000 in 1891 to £986,500 in 1920. Much land in this region is devoted to stock-raising; this becomes the chief occupation in the treeless 'upper districts,' where the winters are cold and the country is covered with thick grass.

In the **Bush Veld** of the Transvaal, and over the greater part of the Orange Free State Province, especially in the neighbourhood of Vereeniging, the climate is well adapted for the cultivation of maize, which is the principal crop. The cold, bright weather

during the long harvest season prepares the grain for export without artificial treatment.

The **High Veld** of South Africa, a vast undulating plateau 5000 feet above sea-level, is at present almost entirely pastoral, except in the extreme south-west of the Transvaal, where maize is the dominant crop, and round the Caledon River and the east of the Transvaal, where wheat is cultivated under conditions similar to those of the eastern Downs of Australia. Sheep, the most important live-stock, are reared chiefly for their wool, while cattle are bred mainly for draught purposes. In the higher western regions the native sheep are kept, but in the more favoured parts the merino sheep is bred for its wool. The hardy goat, which can live in much less favourable regions than the sheep, is widely distributed; the Angora goat from Asia Minor is reared, especially on the Great and Upper Karroos of the Cape Province, for its hair (mohair), of which the export in 1922 amounted to 6,000,000 lb. (£600,000), the principal market being at Port Elizabeth. Ostrich-farming is important.

Horses cannot be used unless 'salted'—that is, protected from the fatal horse-sickness, to which they are very liable. Ponies, however, are reared in the Basuto highlands and in some parts of Natal and the Cape Province, in the extreme south-east of which horse-sickness is fortunately unknown.

The conditions on the **Rhodesian plateau**, between the Limpopo and the Zambezi (Southern Rhodesia), resemble those of Queensland immediately north of the tropic. The altitude of the plateau, ranging from 3500 to 5000 feet, counteracts most of the disadvantages associated with a tropical country. With the

northward extension of the railway from Bulawayo through Livingstone and Northern Rhodesia to the Star of the Congo, in the south of the Katanga province of the Belgian Congo, and the extension through Southern Rhodesia to Salisbury, which is connected by a line through Umtali with the port of Beira, important developments are taking place throughout the country. Southern Rhodesia is rich in minerals; the output during the year 1921 exceeded £4,700,000, consisting mainly of gold, but also including considerable quantities of silver, copper, lead, coal, and chrome ore. The country is well suited for cattle-raising; the cultivation of tobacco, which has now found a place in the British market; of maize, which is the staple crop; of oats, wheat, and barley, chiefly grown as winter crops under irrigation; and of the principal European and subtropical fruits and vegetables. Cotton-growing has been attempted on a small scale.

The conditions in the Nyasaland Protectorate, with its average elevation of 3000 feet, are those of a purely tropical country, where Europeans cannot settle permanently except in a few favoured spots; the white population numbers less than 1500, while the native inhabitants exceed a million. Cotton has been planted with marked success, and in 1921 formed 16 per cent. of the total exports. Tobacco has also proved a successful crop, and the export is increasing annually. The acreage under coffee has shown a decline in recent years, but the export of tea has risen to nearly 500,000 lb. The climate favours the cultivation of maize, rubber, fibres, and chillies. Labour is abundant and cheap, but the present cost of transport is a serious hindrance to the development of the

country. A railway, 174 miles in length, connects Blantyre and Port Herald on the Shiré River with Chindio, on the Zambezi, which has not yet been bridged to join the line opened in 1922 from the Zambezi to Beira. It is vitally important to the commercial expansion of Nyasaland that this line should be continued northwards from Blantyre to Lake Nyasa, which affords water transport for 360 miles.

Minerals.—Gold and diamonds are the all-important minerals in South Africa. Diamonds are found in the filled pipes of old volcanoes, which are scattered about the region near the confluence of the Vaal and the Orange, where Kimberley, the chief diamond centre, is situated. The 'stones of fire' are also found in the Orange Free State Province, at Jagersfontein, where some of the finest diamonds have been discovered, in the Boshof district, and in the neighbourhood of Kroonstadt. The largest of all the diamond-mines in South Africa was discovered in 1902 near Pretoria, and here the famous Cullinan stone was obtained in 1905. Gold is found in many parts of the Transvaal, in the districts of Lydenburg, Barberton, and Zoutspanberg, and on the Rhodesian plateau, chiefly within a radius of a hundred miles of Salisbury. The most important mines are those of the Witwatersrand, or Rand, where the metal occurs in a conglomerate locally known as 'banket.' Johannesburg is the centre of the gold-mining region and the largest town in South Africa, with a population of 290,000 in 1921, of whom half were whites. Copper occurs south of the mouth of the Orange River, where it is mined at Ookiep and Concordia, and carried by a railway to Port Nolloth, 60 miles distant. Still

more important are the rich deposits which have been discovered at Messina, near the Limpopo River, reached by rail from Pietersburg. Platinum deposits have recently been reported from the Transvaal. Tin is found on the northern slopes of the Rooiberg hills, about 70 miles to the north of Pretoria. Seams of poor coal occur in the Stormbergen, in the Cape Province. Coal is the most important mining industry in Natal, and is extensively carried on in the vicinity of the Klip River, between Newcastle and Elandlaagte. Coal is also found in the Vryheid district, and at Somkeli on the Zululand coast. All these mineral fields are connected by rail with the port of Durban, from which large quantities of coal are annually shipped, either for bunker purposes or for export to other parts of South Africa or to Indian Ocean ports. A considerable quantity of Natal coal is consumed by the railways of southern India and Ceylon. The largest output of coal in South Africa is from the Transvaal mines, in the neighbourhood of Middelburg and the Rand, where it is mainly consumed by the gold-mines and on the railways. An important field is being opened up at Wankie, in Southern Rhodesia, and coal also occurs on the shore of Lake Nyasa. Valuable deposits of iron ore are known to exist to the north of Pretoria and in the Vryheid district of Natal, but so far no attempt has been made to develop them. Asbestos is worked in the Victoria district of Rhodesia and the Carolina district of the Transvaal.

Manufactures.—The manufactures are still in an early stage of development, and at present the mining and agricultural resources of the country are by far the most important. The chief manufactures are

those of wine and brandy in the south of the Cape Province, of sugar and rum in Natal, and of tobacco at the Cape, in the Transvaal, and Rhodesia. Some tanneries and saw-mills exist; and a few cotton-gineries have been established in Nyasaland. The Cape ox-wagon is a notable local product.

Trade.—Gold and wool are by far the most important exports. Next in order of value come maize, ostrich feathers, hides and skins, coal, mohair, diamonds, and bark; the export of South African fruits and tobacco is increasing. Every kind of manufactured article is imported, as well as food, under which heads are included not merely luxuries, but the necessities of life. At present the United Kingdom contributes nearly 55 per cent. of the imports.

Means of Communication.—The natural means of communication in South Africa are bad. No good harbour exists except at Delagoa Bay and at Saldanha Bay, the latter of which lacks fresh-water. The harbours of Cape Town, Port Elizabeth, East London, and Durban have been constructed at very great expense, and are not yet entirely satisfactory. Cape Town, on Table Bay, the nearest port to Europe, is the port for much of the passenger traffic, especially since the building of the line across the Karroos and the Veld to the diamond-mines of Kimberley, a line now extended northwards through Bulawayo, across the Zambezi gorge at the Victoria Falls, beyond the frontier of the Belgian Congo. The produce of the mines is sent to Cape Town, Port Elizabeth, and East London. From the two latter ports a great part of the wool is shipped.

The development of the mineral fields has led to

the building of railways from all the South African ports. In addition to the continental line from the Cape, a railway runs from Mossel Bay, Port Elizabeth, and East London through the centre of the Orange Free State Province and the Transvaal, by Bloemfontein, Johannesburg, and the Rand goldfields, Pretoria (the seat of the Union Government) to Pietersburg, from which point it has now been carried to the border of Rhodesia and the copper-mines of Messina. The line from Johannesburg to Durban (Port Natal) traverses the Newcastle coalfield, while that from the Rand and Pretoria to Lourenço Marques passes through the Middelburg district. Branches have been constructed from the main lines to the adjoining mineral fields, and are being steadily extended. The line from the Cape through Bulawayo has been continued past Selukwe to Salisbury, in Southern Rhodesia, which is also joined to the port of Beira by a railway through the Manika goldfields, on which New Umtali is built. The railways of South West Africa have been connected with the Union system and relaid on the Union gauge of 3 feet 6 inches to Walvis Bay. Where railway and motor transport have not yet penetrated, the ox-wagon is the common mode of carriage.

The economic conditions of South Africa are much more complex and much less satisfactory than those of Australia. The plateau configuration of South Africa militates against ready communication with the coast. The rivers flow in deep gorges, so that water cannot be easily reached for irrigation purposes; and not merely does their volume vary, as in Australia, but they are broken by rapids. On the other hand, the supply of underground water, especially in Bechuanaland, re-

sembles that of western Queensland and northern New South Wales. In the territories south of the Limpopo only a quarter of the population is white. In the other parts of South Africa the blacks outnumber the whites by millions to thousands. The presence of this black population has led to their employment for almost all manual labour, even in parts where whites can live and work without injury to health. Since the conclusion of the Anglo-Boer war the white peoples in South Africa have united in an effort to develop the great natural resources of their country, and to find a permanent solution for the many grave and difficult problems with which they are confronted. The financial arrangements of the Union have been reorganised and placed on a stable basis, land settlement has been encouraged, the railway system has been consolidated and much wasteful competition for traffic between the railways of the different provinces has been eliminated, the conquest of stock diseases is being undertaken, and the need for extending educational facilities and for encouraging the growth of industries is being met. Now that these questions are being successfully dealt with, the most difficult of all the South African problems will still await a solution—namely, the colour problem.

CHAPTER XI.

SOUTHERN SOUTH AMERICA.

SOUTH AMERICA tapers acutely south of the tropic of Capricorn. In latitudes corresponding to those of South Africa it has almost the same breadth, but its

configuration is very different. The central band is a vast plain, penetrated by the shallow La Plata estuary, and bordered on the east by the southern highlands of Brazil, which are not so high as the tableland of eastern South Africa, and on the west by the chains of the Andes, which, north of the Uspallata Pass, do not descend below 10,000 feet, and form a practically insuperable barrier. South of this pass and the Plate estuary the eastern highlands practically disappear, the plain rises to the Patagonian plateau, the western heights become lower, and rivers flow from their eastern slopes across them in deep gorges to the Pacific.

The climate presents great contrasts in east and west and in north and south. The eastern region round and north of the Plate receives wet summer winds; the western region here, as in Africa, is dry and semi-desert. To the south the southern New Zealand conditions are found in a more intense phase; the west is very wet with rain brought by western storm winds; but east of the mountains the climate is very dry, except close to the coast, where the winter storm winds bring a little rain. The chinook or foehn winds are common at the eastern base of the Andes, as of the Rockies or the Southern Alps of New Zealand.

Economic Divisions.—The North-east Region of Summer Rains resembles south-east Australia, with this exception, that the plains to the east of the Highlands are much better watered and more fertile than the corresponding lowlands of Australia south of the tropic. It is of interest to note that in North America the analogous plains north of the Gulf of Mexico are likewise well watered, the configuration in both cases favouring instead of hindering the

inward movement of moisture-bearing air. Coffee is the chief crop of the Highlands close to the tropic, while farther south cattle and sheep roam on the campos. On the plains of the Uruguay and Paraguay maize and wheat are cultivated in ever-increasing quantities; and in the north oranges, olives, vines, tobacco, and other warm temperate crops are grown. The thick forests are confined to the coast and wetter valleys; the Gran Chaco consists of open woodland. From these much timber might be obtained if transport facilities were greater. The *yerba maté*, or Paraguayan tea, is the most notable spontaneous product. On the western and southern margins, where the rainfall is small, cultivation gives place to stock-raising, or the pampas are occupied by semi-wild horses.

The dry north-west must be divided into three parts: (1) The lands east of the Andes, whose snows supply water for irrigating the land, on which cotton, sugar, vines, and Mediterranean fruits of all kinds grow. This is a more favoured Mildura region. (2) The mountain area, with silver and other mineral ores. (3) The Chilean deserts, with important nitrate deposits.

Central Chile, with wet winters, resembles the south of Australia and the Cape peninsula regions in its Mediterranean type of climate and products, which make this the richest agricultural part of Chile.

Southern Chile, with rain at all seasons, is a mountainous land cut up by many fiords, as in southern New Zealand, and bordered by islands separated from each other and the mainland by sounds. Here Scandinavian conditions are found nearly 10° nearer the equator. Fishing and the exploitation of the thick forests are not developed for lack of a market.

Patagonia is the dry south-eastern region, and is as yet thinly peopled. Stock-raising may well become important, and the lands where the chinook (cf. western Canada) influence is felt will be of agricultural importance when routes are opened to them. Sheep-farming has become important in the Chubut valley and in districts within easy reach of Magellan Strait.

The mineral wealth is considerable in the Andes and in southern Brazil. Gold, silver, and copper are found in the Andes, and coal occurs in Chile near Concepcion; lignite and petroleum in the Argentine.

Political Divisions.—The republic of Chile occupies the western regions, Argentina the eastern, except where Paraguay, Uruguay, and southern Brazil extend in the north-east. The Falkland Islands are British.

Chile.—The dry northern region, where nitrates, largely worked by aid of British capital, and precious metals are the source of wealth, extends north of the tropic. The Longitudinal Railway runs throughout the length of the country from Tacna in the north to Puerto Montt in the south, with branches to the various ports. Antofagasta is linked up, through Oruro, with La Paz, the principal town of Bolivia, which, with the completion of the railway to Arica, has been brought within twelve hours of the Pacific seaboard. The Pacific ports provide the outlet not only for the trade of Chile, but also for much of the valuable mineral traffic of Bolivia; where the railway has not yet penetrated, or where the rates are prohibitive, the transportation across the Andes is largely carried out by means of animals, chiefly llamas, each of which is able to carry a load of 100 lb. Iquique and Taltal export nitrates, Caldera (port of Copiapo) silver, and

Coquimbo (port of La Serena) copper. Antofagasta is a large railway centre and nitrate port; while great developments are taking place at Mejillones, an excellent harbour situated fifty-seven miles to the north of Antofagasta. Nitrates are shipped from this port, and the railway from Tupiza (Bolivia) will probably attract much of the traffic of the northern Argentine and Bolivia as well as of its own immediate hinterland. Arica, the most northerly port, is another mineral outlet.

The central valley of Chile is the agricultural region, where wheat, which is the chief crop, barley, oats, maize, and grapes are cultivated. Valparaiso, the principal port, is the western terminus of the trans-Andine route through Mendoza and Los Andes, and it is also connected with Santiago, the capital of the country, and Valdivia, by the Longitudinal State Railway. Coronel and Lota, adjacent to the Chilean coalfield, are coaling-stations; at the latter place the poorer coal is consumed in the local drain-pipe factory, glassworks, and copper foundry. From Lebu coal is shipped to the copper-smelting works at Guayacan. The output of the Colico mines is mostly sent to Concepcion for use on the state railways. Talcahuano, the port of Concepcion and the best harbour in Chile, is the principal arsenal and dockyard and the headquarters of the Chilean navy.

Nitrates, copper and copper ores, wheat, borates, iodine, leather, and wool are the chief exports; textile manufactures, machinery, coal, and subtropical produce are the leading imports. Most trade is carried on with the United States, followed by the United Kingdom, France, and Peru.

Argentina is a republic with a great variety of

physical and economic conditions. It consists of four distinct regions: (1) The subtropical region, which includes the northern provinces, and is mostly covered with natural forest. The chief crops under cultivation are cotton, maize, and sugar-cane; while considerable attention is given to the rearing of horned cattle, sheep, and horses. (2) The sub-Andine region in the west, where the vine is chiefly cultivated, and large quantities of alfalfa and maize are grown on irrigated lands. (3) The riverine or pampa region, embracing the great Plate basin, with the cultivation of wheat and stock-raising as the leading occupations. (4) The Patagonian region, extending south from the river Colorado, where stock-raising is the chief industry.

The Argentine now ranks as one of the great food-producing countries of the world, and it contributes a considerable proportion of the supplies of the United Kingdom. Flour-milling and sugar-making, meat-packing, dairying, and distilling are the most important industries. Cotton is being grown in the north, especially in the Chaco district, and several spinning and weaving establishments have been set up.

Gold, silver, and copper are worked in the provinces of Catamarca, San Juan, and Rioja, at the base of the Andes; petroleum in Comodoro Rivadavia in the south.

The agricultural development of Argentina has closely followed the extension of the means of transport; in building a great network of railways over the whole country enormous progress has been made since the first import of Argentine wheat into the United Kingdom in the early eighties. From Buenos Aires, the federal capital, on the Plate estuary, lines run southward to Mar del Plata and to Bahia Blanca, and

then up the Neuquen valley to the base of the Andes; westward to Mendoza, from which point a narrow-gauge line crosses the Andes to join the railway system of Chile; north-westward through Cordoba, Tucuman, Salta, and Jujuy to the Bolivian frontier, where the line has been continued to Tupiza to join the Chilean line from Antofagasta at Viacha; and northward through the Chaco to the border of Paraguay. Innumerable lines connect these main railways, and minor traffic centres exist at Santa Fé, San Francisco, Cordoba, and Tucuman. The rivers also form navigable highways, and ocean-going ships can load at Rosario on the Paraná, as well as at Buenos Aires and Ensenada, the port of La Plata city, both on the shallow Plate estuary, which is difficult of access and requires constant dredging. With the opening up of the south-east Argentine, Bahia Blanca is rapidly becoming an important railway centre and a leading port for the shipment of wheat and pampa produce. It is proposed to establish a port at Caleta Cordoba, 9 miles north of Comodoro Rivadavia, where oil may be loaded to tankers by submarine pipes.

Cereals, especially wheat and maize, cattle, dead meat, wool, and hides are the most important exports; the chief imports are rolling-stock, agricultural implements, textiles, hardware, and building materials. The total trade of the Argentine exceeds £250,000,000, of which the United Kingdom has the largest share, both in exports and imports; the United States, France, Belgium, and Italy rank next.

Uruguay is the hilly land north of the Plate and east of the Uruguay. At present it is essentially a pastoral country, possessing vast flocks and herds. Wheat,

maize, and flax are cultivated on the flat lands, and their export is steadily increasing. Vine, olive, and tobacco cultivation is becoming more important. Several gold-mines are being worked in the northern departments, and lignite coal in the south; silver, copper, lead, magnesium, and petroleum also occur.

The chief industry is meat-preserving, carried on at Fray Bentos and Paysandu. Animal products, including meat (chilled, jerked, and in extract), hides, skins, wool, and tallow make up 90 per cent. of the exports, the United States being the largest buyer, then Great Britain, Germany, France, Belgium, and Italy. Argentina and Brazil, however, receive from Uruguay many exports which are re-exported. The United States sends the largest share of the imports, mainly consisting of textiles, coal, and machinery; next in order come Great Britain, Germany, and France. A railway runs from Monte Video, the capital and the principal port, to Asuncion, the chief town in Paraguay; at Posadas the train is conveyed across the Paraná by means of a large ferry-boat. A line has also been built from the capital through Durazno to Rivera, where it joins the railway system of Brazil.

Paraguay, called the Mesopotamia of South America, lies between the Pilcomayo and the Paraná, and is traversed by the Paraguay. The state possesses abundant pasture lands, well suited for stock-raising, which is a growing industry, especially in the Chaco. The conditions of soil and climate have proved favourable for cultivating *yerba maté*, or Paraguay tea, oranges, sugar-cane, coffee, cassava, cotton, bananas, and tobacco. Excellent timber is plentiful, and considerable quantities of quebracho extract for tanning

are exported, chiefly to Germany. Iron, manganese, copper, gold, and kaolin are known to exist, but so far no attempt has been made to develop the mineral resources. The progress of Paraguay has been hindered by the cost and difficulty of transport, the country roads being little better than bullock-tracks, and by the heavy duties imposed on the produce by the countries through which it has to be conveyed to the sea-board. Now, however, a railway connects Asuncion and southern Paraguay with Buenos Aires. A line is partly constructed from Concepcion on the Paraguay to the Brazilian border. Steamers from New York call at Asuncion on their way to Matto Grosso, 3000 miles up the Paraná river system. Dried meat, hides, Paraguay tea, oranges, tobacco (chiefly to Hamburg and Bremen), and timber are the chief exports, trade being carried on through Argentina or Brazil with the outside world.

Southern Brazil resembles Uruguay, but plantations are more numerous, especially in the districts of former settlers. The rest of Brazil is described on page 144.

The Falkland Islands, nearly 350 miles to the east of the Magellan Strait, consist of two large islands and many islets. South Georgia and Graham's Land, with island groups between, are dependencies. The climate is cool, stormy, damp, and foggy; the pastures support hardy sheep. Sheep-farming in the Falklands and whaling in South Georgia are the chief occupations; whale produce, wool, skins, and tallow form the leading exports. Port Stanley, the capital, is a coaling port on the east island. Here ships damaged in the stormy regions off Cape Horn put in for repairs.

CHAPTER XII.

INDIA AND CEYLON.

Position and Configuration.—India consists of the central of the three southern peninsulas of Asia, and the regions immediately to the north as far as the Himalaya Mountains. Physically it is made up of four very different parts: (1) the mountains of the north; (2) the broad band of the alluvial and sandy Indo-Gangetic plains, never rising over 1000 feet, and varying in width from 100 to 400 miles; (3) the peninsular plateau of the Deccan, south of 25° N; (4) Burma.

The rivers Indus, Ganges, and Brahmaputra all rise in the Himalaya Mountains and flow across the northern plains to the sea, which they reach across great deltas. The Deccan plateau is much higher in the west than in the east. It has a steep slope to the Arabian Gulf, and a long slope to the Bay of Bengal, down which flow the rivers Mahanadi, Godavari, Krishna, Kavari. The only important rivers to the west are the Narbada and Tapti, in the north. In the south the low Palghat Pass lies south of the Nilgiri and north of Cardamom Mountains, which form part of the Western Ghats or Sahyadri escarpment, and joins the eastern and western coastal regions. Burma is drained by the Irawadi system.

Climate.—India occupies similar latitudes to the continent of Australia. If Ceylon be added to the former, we must add British New Guinea to the latter.

India, however, has the mountain barrier of the Himalayas on the polar side, whereas the polar side of Australia is bounded by the open ocean. This circumstance makes a great difference in the climate of the more temperate parts of the two countries. The mountains hinder, the ocean favours, the inflowing of winds from cooler regions. India is, therefore, hotter than Australia in the same latitudes.

The temperature of India varies comparatively little with latitude. The extra-tropical regions are, however, coolest in the northern winter, when their temperature is like that of England in June, and the north-west is hottest in summer. It therefore has the greatest range of temperature. The peninsular portion is uniformly warm at all seasons.

The north-west of India, like the south-west of Australia or South Africa, receives most rain in winter. So do the south-east of India and the east of Ceylon, lying in the track of the north-east trades, which have absorbed moisture in crossing the Bay of Bengal. The north-east trade-wind is the normal wind of the winter half-year; but in summer, instead of being intensified as is the south-east trade-wind of Australia, it disappears, and is replaced by a south-westerly or south-easterly monsoon wind, which moves towards the low-pressure centre formed over the region of greatest temperature in the north-west.

For most of India this summer monsoon brings the rain, so that, as in the greater part of Australia and South Africa, most rain falls in summer. In the extreme south-west of India and western Ceylon rains diminish in intensity towards midsummer, so that we

may speak of two rainy seasons. The single rainy season in the north is the equivalent of the equatorial rains of northern Australia.

The temperature in most parts of India, therefore, is favourable for all kinds of tropical and subtropical produce. The distribution of plants depends on the distribution of rain. There is no equivalent to the Mediterranean climate and produce of Australia or Africa, except in the extreme north-west, for the temperature of the south-eastern region, which receives rains during the northern winter, is never under 75° F. Owing to the configuration of India, the dry conditions which produce desert, found in Western Australia and South Africa, are confined to the region round the lower Indus and the middle Irawadi. The peninsular part is exposed to the over-sea wind of summer, and only the eastern slopes of the Western Ghats are comparatively dry.

Economic Divisions.—The mountain barrier which encloses the north of India is wettest in the east, where it reaches farthest south, and is driest in the north-west. The vegetation therefore becomes less luxuriant from east to west. At the foot of the mountains in the east is a dense useless jungle called the Terai. Sal is the most important timber-tree in the forests of the lower slopes, followed by the deodars and other conifers of the higher forests, above which are rhododendron scrub and meadows moistened by the melting of the eternal snows. Tea is cultivated on the mountain-slopes of Darjiling and Kumaun, the latter in the basin of the upper Ganges. The mountains west of the Indus plain receive very little rain, and that mainly in winter. Wheat, millets, and many

fruits are cultivated in the valleys where irrigation is possible.

The western part of the great plains is desert or semi-desert, supporting a few sheep, goats, and camels. Round its edges, where the rainfall is slightly greater, and more particularly where irrigation is possible, wheat, oil-seeds, millets, maize, and even some rice are cultivated, the latter round the lower Indus. Irrigation is well developed in the Punjab and the upper half of the Ganges basin, where wheat is grown as a winter crop, and sugar-cane in summer. Pulses and millets are also cultivated, and some rice in the moister parts at the foot of the mountains. The cultivation of toria is rapidly extending in the Central Punjab. Cotton is grown along the Jumna, and indigo between the Jumna and the Ganges and in the region round the confluence of the Sutlej and the Indus. In the lower Ganges, east of Lucknow and Allahabad, rice is the most important cereal, and sugar-cane, indigo, and tobacco are among the principal crops. Opium is grown between Allahabad and Patna, and jute round the lower Ganges and Brahmaputra, and especially on the delta, where the soil, which is quickly exhausted by a crop of jute, is regularly renewed by the flood waters. In Assam, tea is cultivated in the valley of the Brahmaputra, and on the hills to the south, where rubber is also collected.

The Deccan may be divided into the western escarpments, which receive heavy summer rains; the drier grass-lands to the east; and the eastern slopes and coastal plains, with summer rains in the north and winter rains in the south. The western mountains and the hills in the wetter east have many teak-forests.

Millets (especially jowar and bajra), pulses, and oil-seeds (linseed and sesamum) are grown in all parts of the Deccan. In the hillier central region wheat flourishes, and cotton is grown south of the Narbada on a rich black volcanic soil which holds moisture easily, as well as in the lowlands of the Kathiawar peninsula. Sugar-cane also grows on this peninsula and in Mysore. Tobacco and indigo are cultivated on the eastern coastal plains. Rice is grown on all the low ground, and even on the hilly lands of the Mysore and the Central Provinces. Tea and a little coffee are cultivated in the Nilgiri and Cardamon Hills, and the cinchona is grown for the protection it affords to the young tea-plants, as well as for the 'Peruvian bark,' yielding quinine. Coco-nut palms flourish round the southern coasts.

In Ceylon the mountains are heavily clad with forests, and in the clearings tea, cacao, and cinchona are cultivated. Rice is of importance on the coastal plains, where the coco-nut and Palmyra (sugar-yielding) palms flourish, and cinnamon and tobacco are cultivated.

The hills of Burma are covered with immense forests of teak. Rice is the principal crop of the plains, where tobacco, millets, and pulses, and in the north some cotton and wheat, are also grown.

Minerals.—Coal is scarcely used at all in the indigenous industries of India, and is little needed for domestic purposes; but with the modern industrial expansion of the country and the rapid extension of its railways, there has been a remarkable development of the coal resources of India to meet the increasing demand for fuel, and coal has now become the most

valuable mineral in the country. It is not widely distributed, especially in the peninsular part of India. Over 25 per cent. of the total output, which has increased from six and a half million tons in 1901 to over nineteen and a quarter million tons in 1921, is obtained from the Bihar and Orissa fields at Jherria, about 180 miles north-west of Calcutta, Raniganj, Bokaro, and Giridih. Of importance to the railways and the cotton-mills of Bombay and the Central Provinces are the coal deposits in the Pench Valley and at Mohpani, Warora, and Bellarpur in the Central Provinces. The Singareni mines, in the Nizam's Dominions, are the most productive outside the Bengal coalfields. A large output from Umaria, in Rewah, is almost entirely consumed on the Indian Midland and Bengal-Nagpur Railways. An extensive field is worked at Makum, in north-east Assam, the output being sent to Dibrugarh, on the Brahmaputra, and another in the Swebo district of Burma. The most important deposits in the north-west of India are in Baluchistan, the chief mines being at Sor, near Quetta, Bolan, and Khost. Coal is also worked at Jammu in Kashmir, and at Bikanir in Rajputana. Gold occupies the second place on the list of Indian minerals. It is chiefly obtained in the Kolar district and other parts of Mysore. Salt is an essential mineral in a country like India. The greater part of the supply is obtained from sea-water by solar evaporation in the Rann of Kutch, on the Bombay coast in the west, and on the Madras coast in the east. About a fourth of the production comes from subsoil water and lakes, especially from Lake Sambhar and other parts of arid Rajputana and of Jodhpur, while one-

tenth of the output is obtained from the Salt Range of the Punjab. Considerable quantities of **Saltpetre** are found in Bihar. **Iron** is widely distributed throughout India, but, so far, only those deposits in the neighbourhood of fuel-supplies have been extensively developed. Valuable ores are found at Salem, in Madras, but coal is not obtainable in the vicinity. Iron and steel works have been erected near Asansol in the Burdwan district of Bengal, and utilise the ores from Gurmahisani in the Mayurbhanj State, along with fuel from the Jherria coalfield. Meanwhile the most extensive development of Indian iron ores on modern lines is being carried out by the Tata Iron and Steel Works at Jamshedpur, where both ore and fuel are within easy reach. **Petroleum** occurs in the Punjab and the United Provinces, in Baluchistan, and at Badarpur, in Assam; but by far the most productive fields are situated in the valley of the Irawadi, the chief localities being Yenangyaung, Singu, and Yenangyat, in the district of Magwe, which furnished in 1920 over 95 per cent. of the total Indian output. 'India has for many years been the leading producer of **Mica**, turning out more than half the world's supply,' the chief sources being Bengal, Bihar, Madras, and Rajputana. The country has also obtained an important place in the production of **manganese**, the output having increased from 171,000 tons in 1903 to 538,000 in 1919. The ore is mainly obtained in the Central Provinces, in Bihar and Orissa, at Panch Mahals, in Bombay, and in Mysore. Part of the output is shipped to be smelted in the United Kingdom, Germany, and the United States. **Tin** is rarely found in Peninsular India, but extensive deposits exist in Burma,

especially in the southern part of Tenasserim, whence it is sent to the Straits Settlements. The most important tin-fields are in the Malay Peninsula. Precious stones come from Burma and Ceylon; Burma rubies and Ceylon sapphires are celebrated.

Manufactures.—A country so populous as India naturally requires an immense supply of manufactured articles of many kinds. The great bulk of these is provided by native labour. In the nineteenth century, however, vast shipments of textiles, especially cottons and hardware, were made from the factories of Europe, especially from the United Kingdom. But since 1880, and especially since the opening of the twentieth century, a vast economic and industrial transition has been taking place in India. Numerous factories and mills have been built to manufacture locally grown cotton and jute into cloth, as well as mills for the manufacture of paper and of woollen goods, for which, however, the demand in India is comparatively small. The majority of the cotton-mills are in Bombay Presidency, especially in the city of Bombay and in Ahmedabad. Hydroelectric power is transmitted from great water works on the Ghats. The mills are largely owned by Indians, and China forms the principal market for the yarn produced. The jute-mills, on the other hand, are mostly controlled by the British, and are mainly centred at Howrah, a suburb of Calcutta, which is now a serious rival to Dundee. In addition, there are numerous flour-mills (chiefly in the Punjab), breweries (the largest of which is at Murree in the Punjab Himalayas), rice, saw and oil mills in Burma and elsewhere, sugar factories, silk filatures, and indigo factories, chiefly in Bengal, and printing-presses in

Bengal and Madras, into most of which mechanical power and modern methods are being introduced. Besides the advantages of producing the raw material and having a large market for the manufactured goods, India has plenty of cheap labour. Its disadvantages are (1) that this labour is not nearly so efficient as that of Europe, and in the long-run is almost as costly; (2) that this labour is largely intermittent, depending on agricultural demands, which always have a prior claim; and (3) during the dry season the air is too dry for successful cotton spinning, and has to be artificially moistened.

Means of Communication.—The rivers of southern India fluctuate greatly in volume in the dry and wet seasons, and enter the sea across flat deltas, so that they are of little use as means of transport, although invaluable for irrigation.

The Indus has a swift current and many shifting sand-banks, and can be used only by very shallow craft. The Ganges, on the other hand, is navigable to the very base of the mountains at Hardwar. The Ganges Canal, the upper part of which joins Hardwar to Cawnpore, and the lower part to Allahabad, with several thousand miles of branches, is used for irrigation, and on its main course also for navigation.

The Hugli is the distributary of the Ganges most used for navigation. It has a strong bore and many shifting sand-banks, and is kept open for ocean vessels as far as Calcutta only by constant dredging.

The Irawadi is navigable for river steamers as far as Bhamo, near the Chinese frontier. Ocean vessels sail by its western distributary to Bassein, and by its eastern one to Rangoon. The Salwin is navigable

only for about 80 miles. Moulmein is the port on its left bank.

Railways.—There are at present over 37,000 miles of railway in India, the mileage having increased about 50 per cent. during the twenty years ended 1922. Four gauges are used—the standard (5 feet 6 inches), the mètre gauge, and narrow-gauges of 2 feet and $2\frac{1}{2}$ feet. From Bombay, the nearest port to Europe, a line runs northward to Baroda and Ahmedabad, through Rajputana, skirting the western base of the Aravalli Hills, to Delhi, the capital of India. A second line through Kotah and Muttra connects a rich grain-producing area in the Punjab and the United Provinces with the port of Bombay. A third line passes through the Khandwa Gap, in the Satpura Mountains, to Allahabad and Cawnpore. A fourth line through Nagpur gives direct communication between Bombay and Calcutta. A fifth line through Poona crosses the Deccan plateau to the coast of Madras, while a sixth runs southward to the Portuguese port of Goa. A line crosses the peninsula from Goa to Madras, and from the latter port a line runs southward to Madura and Tuticorin, and is continued by means of a viaduct across the Pambam Channel to the island of Rameswaram. From Madras a railway runs along the coast to Calcutta. The flat nature of the country has facilitated the construction of a great network of railways throughout the Indo-Gangetic plains. Main lines on both sides of the Ganges connect Calcutta with the Indus valley and with the extreme north-west of India; Delhi, Cawnpore, and Allahabad in the Ganges valley, Multan and Lahore in the Punjab, are important railway centres. From the main lines important

branches run to the foothills; from the Peshawar-Karachi line, branches run to the Afghan frontier at the Khaibar Pass and at Chaman. From Chittagong a line runs through eastern Bengal to the extreme north-east of Assam, and this system is being connected with that of Burma, which runs from Rangoon through the Sittang valley and Mandalay to Myitkyina. A short line follows the Irawadi from Rangoon to Prome. A railway runs throughout the length of Ceylon, with connections to the tea-plantations in the mountains.

Irrigation.—The land artificially irrigated by canals, tanks, and wells in India now approaches 50 million acres. A great network of canals makes Sind and the Punjab fertile. ‘Colonies’ have been established on lands formerly waste, and in the Punjab alone 10,500,000 acres were irrigated by canals in 1921. Still greater schemes are in progress between the Jhelum and Sutlej rivers, and the Sukkur Barrage will greatly develop Sind. The Ganges Canal, from Hardwar to Cawnpore, is 1000 miles long, with numerous branches, which irrigate the Doab between the Ganges and the Jumna. The deltas of the Mahanadi, Godavari, Krishna, and Kavari (Cauvery) are all canalised. Irrigation canals have also been constructed in the districts of Mandalay and Swebo, in Burma. Artificial lakes (tanks) have been formed, especially in the Deccan, and wells sunk, particularly in the Ganges valley, for irrigation purposes.

Trade.—The land frontiers of India are difficult to traverse, and the trade carried over them is small.

From Quetta, goods of eastern manufacture are sent to eastern Persia by Seistan. Trade with Afghanistan is carried on from Quetta with Kandahar, and by the Khaibar Pass with Kabul.

Raw wool, fruits, and vegetables are the chief imports from Afghanistan. Leh, on the upper Indus, has some trade with Chinese Turkestan over passes more than two miles above the sea-level. Cottons, mainly brought from Europe, are the chief import, and hides, skins, carpets, and the drug charas, are the chief exports across these frontiers. Trade with Tibet is carried on by the Chumbi through the frontier port of Yatung, and is slightly increasing. Some trade is done with eastern China through Kunlong Ferry.

The main trade of India, however, is sea-borne. In spite of its immense population, India exports large quantities of food-stuffs. Wheat, from the Punjab through Karachi, and from the Deccan through Bombay, shows small exportable surpluses. Little rice is available for export in Bengal, but great quantities are shipped from the less densely peopled Burma. Tea from Assam and Darjiling, indigo, opium, jute, oil-seeds, and hides are exported from Calcutta. The tea, coffee, and tobacco of southern India are exported mainly from Madras. Cotton is one of the chief exports of Bombay. The growing industrial activity of India is shown by the fact that manufactured goods now form a considerable and increasing proportion of the exports. In 1879 manufactured goods formed 8 per cent. of the total exports; in 1908 the proportion had increased to 22 per cent., and in 1921-22 to 27 per cent. During the same period manufactured imports had risen from 65 to 70 per cent. of the total imports to India. Cotton manufactures, metals, machinery, and sugar are by far the most important articles imported; next come railway plant, grain, mineral oils, coal, hardware, provisions and liquors, silk and woollen goods and apparel.

Most of the import and export trade is with Europe

especially with the United Kingdom. It is steadily increasing with Japan, and also with the United States, the Dutch East Indies, and Australia.

Ceylon is a crown colony, and is politically separated from India. Coco-nuts, rice, tea, cacao, and rubber are the chief items of cultivation, the last-named having become an important source of wealth within the last twenty years; other valuable crops are cinnamon, coffee, and tobacco. Cotton, mango, and various fruits and vegetables have recently been introduced. Ceylon possesses considerable stores of plumbago and precious stones, and the pearl-fisheries are an important source of wealth. Cotton goods, coal, rice and other grain, and machinery are the chief imports. Ceylon tea is the chief export, but coco-nut products, plumbago, rubber, cacao, areca nuts, coffee, and quinine are also important exports.

CHAPTER XIII.

CENTRAL AFRICA AND INTERTROPICAL SOUTH AMERICA.

THESE continental lands agree in possessing a very hot and in most parts wet climate, favourable to the growth of dense forests in the lowlands, and rich savanas on the uplands. At present, spontaneous forest growths (more especially rubber), ivory (in Africa), and hides are of economic importance. The unhealthy climate hinders the development of the lowlands by the white man, who has, however, formed some plantations in the higher regions worked by negro or imported coolie labour.

CENTRAL AFRICA.

Position and Configuration.—Central Africa may be defined as lying between 15° N. and S. of the equator, between the Zambezi, the Niger, and Lake Chad. It consists of the Eastern Plateau of the Great Lakes and Abyssinia, over 4000 feet high; the Western Plateau of the Guinea Highlands; and the basins of the Zambezi, Congo, Upper Nile, Shari, and Niger.

The coast is regular, and bordered by a low plain, usually of no great width, above which the land ascends by steep escarpments to the plateau. The coastal plain, however, extends a considerable distance up the Zambezi and Niger valleys, both of which are difficult of access from the sea, from the shallowness of the distributaries of their mangrove-fringed deltas, and the dense, wet jungles of their lower basins. The Congo, on the other hand, enters the sea by a deep estuary, but the passage up the river is barred by a succession of magnificent cascades and rapids. Once the higher ground is reached, both the Niger and the Congo offer extensive waterways, to which the great lakes of the East African Plateau must be added. Railways are now being built from the coast to these internal waterways, and are described in the pages which follow.

Climate and Vegetation.—Throughout this region the air is always hot, except on the higher plateaus, where it is often cold at nights. Near the equator there are two dry and two wet seasons, the latter occurring when the sun is nearest the zenith at noon—that is, near the two equinoxes. Between Victoria Nyanza and Tanganyika there is no completely dry period.

Towards the northern and southern limits of the region the rainy season occurs at midsummer, while midwinter is dry. In the lowlands the rainfall is plentiful, and round the Guinea coast it is very abundant. Here the dense tropical forests are found. The higher plateaus have a much smaller rainfall, and are grass-lands (savanas) with wooded belts along the river-courses, and clumps of trees in the moister regions between the rivers.

The Congo-Zambezi Plateau is a rich savana-land, with dense river-woods. It is supposed to contain many economic minerals. At present it is practically unoccupied by the white man except in the Nyasa region and in the extreme west. In both coffee flourishes, and other tropical plants, including cotton, are cultivated on a smaller scale. Ivory is still obtained from the interior. In most regions roads are absent, and goods are carried by porters over narrow foot-paths. A road has been cleared between Lakes Nyasa and Tanganyika, and other roads have been made in southern Nyasaland; that to Chiromo on the Shiré connects with the steamers plying on the lower Zambezi, most of which use the Chinde distributary to reach the sea. Railways from St Paul de Loanda and Lobito Bay on the west coast are being extended towards the interior; and the transcontinental line from the Cape serves this region. From Beira the Trans-Zambezia railway has been constructed to the Zambezi at Murraca, opposite Chindio. Politically the plateau is divided between Portugal and Britain.

Portuguese West Africa, or Angola, lies in the west. It is dry along the coast, but wetter on the loftier highlands, where coffee is cultivated and cattle are

reared. The cultivation of cotton is increasing. The province contains valuable deposits of petroleum, copper, iron, and salt. Its main exports are coffee, rubber (which, however, is gradually being exhausted), wax, vegetable oils, coco-nuts, and sugar, exported through St Paul de Loanda, Benguela, Mossamedes, Ambriz, and Lobito. From Loanda a railway runs inland to Malange. An important line to Chinguar from Lobito Bay will eventually reach the mineral fields of the Katanga, in the Belgian Congo, and will be linked with the Cape-to-Cairo railway.

North of the upper Zambezi is Northern Rhodesia, which was separated from Southern Rhodesia and made a crown colony in 1924. Its area is 291,000 square miles, but its European population is under 4000 inhabitants. Rubber, cotton, and maize are cultivated in the neighbourhood of Fort Jameson and in the Kafue district. Tobacco is grown by the natives, and a wide variety of tropical and sub-tropical fruits can be cultivated. The plateau region offers excellent conditions for cattle-rearing. Gold, lead, copper, and zinc are the principal minerals, and some coal has been discovered. The eastern part of the territory is crossed by the trunk railway from Livingstone, the administrative centre, by Broken Hill into the Belgian Congo. Roads are now being constructed, and the main rivers, the Zambezi, Kafue, and Chambezi, can be used for transport purposes.

Nyasaland (formerly the British Central Africa Protectorate) lies to the east of Northern Rhodesia and to the west and south of Lake Nyasa, and is one

of the most successfully organised and administered of intertropical colonies. Coffee is successfully grown, especially on the Shiré Highlands, and along with tobacco is exported in considerable quantities. Rice, maize, wheat, and other cereals are cultivated. The cultivation of cotton, both Egyptian and American varieties, and of tea is increasing. An extensive inland waterway is provided by Lake Nyasa and the Shiré River, the principal ports being Port Herald and Chiromo, Fort Johnston, Kotakota, and Karonga. A railway from Chindio on the Zambezi runs through Port Herald to Blantyre, the chief settlement, and will be extended to the shores of Lake Nyasa. Steamers link Chindio with the Trans-Zambezia railway.

Madagascar, a large island off this coast, twice the area of the United Kingdom, was declared a French colony in 1896. Its mountains run from north to south, and are steepest on the eastern side, which is also the wettest and most densely forested. Savanas prevail on the summit and in the south-west. The forests yield rubber, cattle feed on the grass-lands, the cultivated area produces all kinds of tropical plants, and the mineral wealth is now being developed.

Rice, gold, cattle, hides, tanning bark, rubber, raffia fibre, wax, and vanilla are the chief exports. The trade is carried on almost entirely with France and other French colonies. The chief ports are Tamatave (with a railway to Antananarivo) and Majunga.

The Plateau of the Great Lakes is over 4000 feet high, and is relatively dry. It is an open savana, which feeds immense numbers of cattle and sheep. Millet is the principal grain cultivated. In the lower lands round the Victoria Nyanza the banana flourishes.

The highlands to the east, rising to greater heights, are relatively healthy, and it is believed that the Highlands of Kenya Colony, up to the snow-line, are suitable for European settlement. The wet and malarial east-coast plain produces rubber.

The islands of Zanzibar and Pemba are noted for their spices, especially cloves.

Politically, the plateau is divided among Portugal, Britain, and Italy.

South of the river Rovuma and east of Lake Nyasa is Portuguese East Africa, which extends up the valleys of the Zambezi and Limpopo. The principal products exported are rubber, sugar, ores, beeswax, and ivory. A large transit trade is carried on between the sea-board and the British possessions lying to the west of the territory. The leading ports are Lourenço Marques, an important coaling station, through which most of the sea-borne trade of the Transvaal Province passes; Beira, Inhambane, Mozambique, Ibo, Chinde, and Quilimane. From Delagoa Bay a railway runs to Pretoria, and a line has been constructed to the borders of Swaziland. From Beira lines run westward to meet the trunk-line from Capetown at Salisbury in Rhodesia, and northward to the Zambezi.

The British territories consist of the political units of (*a*) Tanganyika Territory (mandate); (*b*) Kenya Colony and Protectorate, between the Umba River and Italian Somaliland; (*c*) Zanzibar; (*d*) Uganda, round the northern shore of Lake Victoria; (*e*) British Somaliland, south of the Gulf of Aden.

Tanganyika Territory lies between the Rovuma and the Umba. Vegetable fibres, coffee, ivory, and copra are the chief exports. Many plantations have been

formed on or near the coast, where coco-nuts, rubber, cacao, vanilla, and other tropical plants are grown. Cattle-rearing is important in the highland regions. The ports are Dar-es-Salaam, the capital, and Tanga. The Usambara railway runs from Tanga up the valley of the Ruvu to Moshi, at the base of Kilimanjaro. From the capital the East African Central Railway is in operation through Morogoro and Tabora to Kigoma, on Lake Tanganyika.

In Kenya Colony tropical products are cultivated along the coastal belt and the river valleys; on the uplands almost all crops of the temperate zone can be successfully grown, and stock-raising is important. In the coastal belt, along the Tana River valley, and in the neighbourhood of Victoria Nyanza, the conditions favour the cultivation of cotton, and ginneries have been established at Kilindini, Malindi, and Kisumu. The cultivation of maize, wheat, and coffee is of increasing importance. The colony possesses valuable forest resources, and the growing of the black wattle has become an important industry. Kenya Protectorate includes the coastal strip formerly belonging to the sultanate of Zanzibar.

The Uganda railway runs from Kilindini, one of the two ports of Mombasa, the largest town, through Nairobi, the capital, to Kisumu (Port Florence) on Victoria Nyanza (587 miles), with a branch from Nakuru to Namasagali in Uganda. Transport from the coast to the lake, which was formerly effected by porters and took several weeks, is now reduced to 42 hours. The present exports consist mainly of cotton (chiefly from Uganda), coffee, grain and oil seeds, fibres, hides, and soda.

The town of **Zanzibar** is the entrepôt of East Africa.

Uganda is fertile round the Victoria Nyanza. Sugar, cacao, rubber, and coffee plantations have been established. The protectorate is an important cotton-growing country. The cotton is ginned and baled at Kampala, Entebbe, and Jinja, and the bales are exported by rail and by Lake Victoria through Kenya Colony. Inland transport is by porters, who carry the crop to the ginneries, and by motor vehicles. A railway, built from Jinja, on Victoria Nyanza, to Namasagali, has now been extended into Kenya. Entebbe is the British administrative centre.

The **Somali Peninsula**, partly Italian, partly British, is grass-land, in some parts very poor. It is a pastoral land, and also produces myrrh and other fragrant woods. Inland transport is performed by camels. The British ports are Berbera, Zeila, and Bulhar.

The valleys of the **Congo Basin** are all covered with dense forest, supplying rubber and palm products. The higher ground between the river-courses is less densely wooded and better peopled. Most of the Congo basin south of the Ubangi-Welle and the main river from Stanley Pool to its mouth forms the **Belgian Congo**. It is bounded on the north by French Equatorial Africa, on the east by Uganda, Lake Tanganyika, and Northern Rhodesia, and on the south by Angola. The chief products are rubber, ivory, palm oil and nuts, gum copal, and cacao. The imports consist chiefly of cotton goods, provisions, and machinery. Important mining developments are taking place in the Katanga, an extensive plateau, with an average elevation of 5000 feet, stretching to the west and south-west of Lake Mweru. From Ruwe a broad

belt of rich copper-bearing land extends eastwards for 200 miles. North of the copper deposits, in the neighbourhood of Bukama, is an extensive tin region. Gold is being worked at Ruwe, Lake Kisalé, and at Kilo in the north-east. Coal has been discovered in large quantities in the copper zone of the Katanga and also along the valley of the Lukuga.

On the Congo estuary are the ports of Banana, Boma, and Matadi, above which there are numerous rapids. A port is being constructed at Kinshasa, on the left bank of the river, near Leopoldville. A railway joins Matadi to Leopoldville on Stanley Pool, beyond which the river is navigable to Stanley Falls. All the tributaries within the circle of which this is a diameter are navigable, affording over 6000 miles of waterway. Near the 2000-feet contour line almost all the rivers have rapids, which prevent communication by water with their upper courses, many of which have also long navigable reaches.

It is proposed to construct a railway from Stanleyville southwards along the left bank of the Congo; two sections of the line are at present in operation—from Stanleyville to Ponthierville (65 miles), and from Kindu to Kongolo (90 miles). The river is navigable between Ponthierville and Kindu. A line links Kabalo with Albertville, Lake Tanganyika, whence steamers ply to Kigoma. The Rhodesian railway has been extended across the Congo border to Elizabethville, Kambove, and Bukama. Thus at present much of the trade of the Katanga passes through Beira, but the line from Lobito Bay will eventually provide an outlet for the Katanga on the west coast.

The **Guinea Coast** is one of the hottest and wettest

regions in the world. The forests are consequently very dense, and the climate most unhealthy for all men, especially for Europeans—who have called parts of it the ‘White Man’s grave.’ This unhealthiness is a serious difficulty in the way of its being opened up by Europeans, who in the twentieth as in the fifteenth century are here still mainly traders.

The local trade is in palm oil and kernels and rubber. Coffee plantations flourish in Liberia, and have been formed in the Cameroon colony, and cacao plantations especially in the Gold Coast colony; but most of the produce is still the natural growth of the forest. Cultivated or manufactured articles at the ports have come across the unhealthy forest belt from the fertile and relatively healthy savanas of the Sudan.

The British possessions in West Africa are Nigeria, Gold Coast, Sierra Leone, and Gambia, along with the mandated portions of Cameroon and Togoland.

The colony and protectorate of **Nigeria** is drained by the lower Niger, with its tributaries the Benué, Kaduna, and Rima, and by the Yobé, flowing into Lake Chad, in the north-east. The northern part of the country consists of great lofty plains, dotted with trees, frequently interrupted by conical or table-shaped hills, similar to the kopjes of South Africa, and belonging to the Sudan region; the southern part includes the great delta of the Niger. The forest products, especially palm oil and kernels, and also rubber and mahogany are among the most valuable exports. The principal cultivated crops are cotton, coffee, cacao, and ground nuts, but serious damage is sometimes caused by the dry, dust-laden harmattan, which prevails from November to March. Cattle-rearing is extensively

carried on throughout the plains. Ivory is a valuable export from the Benué River. The cotton industry is extending, and large ginneries have been established at Zaria and Lokoja. The minerals of the country are now being developed, and the tinfields of Bauchi, Kano, and Zaria are an important source of wealth. Coal of good quality is mined at Enugu; silver, lead, and monazite are also found.

In Northern Nigeria are some of the largest towns of Africa, with a flourishing trade entirely in native hands. The Hausas are the great traders of the Sudan, and their trade-routes extend to the Mediterranean and Red Seas, as well as to the Gulf of Guinea. Sokoto, near the Rima; Kano, farther east; Bida, near the bend where the Niger turns southward to its delta; and Yola, at the head of navigation on the important Benué, are the chief centres.

The sea-going trade passes through Lagos, where the bar has been dredged to allow ocean steamers to enter the port. Other large ports are Forcados, Port Harcourt, and Calabar. A railway runs from Lagos, through Ibadan, crossing the Niger at Jebba and the Kaduna at Zungeru, to Zaria, and on to Kano. A branch joins this line from Baro on the Niger. A line from Port Harcourt taps the colliery at Enugu and the tinfields of Bauchi, running via Bukuru to the previous line near Zaria.

The Gold Coast still deserves its name, for gold is obtained along its shores, as well as inland, and in Ashanti. Cacao is the chief export. There is a railway from Takoradi, through the Tarkwa goldfield, Kumassi, and Anyinam, to Accra, the chief port.

Sierra Leone is bordered by lagoons with much local

traffic. Rice, kola, and cassava are staple crops. The capital, Freetown, is built on the best harbour in West Africa. From the capital a railway runs through Bo to Pendembu, with a branch to Kamabai.

The small Gambia colony is completely surrounded by French territory. Ground-nuts form the chief export.

The Sudan is the North African region having a rainy summer and a dry winter season, with rich grass-lands in the south, and poor grass-lands in the north, passing gradually into the desert. It has greater extremes of temperature, a smaller rainfall, and a more healthy climate than the Guinea coast. It is fruitful and well cultivated, producing sorghum and other millets. Flocks and herds are numerous, and the natives in the Niger basin are skilled workers in leather, as well as expert manufacturers of cloth. It may be divided into three parts—the Western Sudan, drained by the Niger; the Central Sudan, drained to Lake Chad; and the Eastern Sudan, drained to the Nile.

The Western Sudan consists of the Niger basin, the upper part of which is French, the lower part British. Of the British Niger protectorate, the southern provinces belong to the Guinea coast region, the northern provinces to the Sudan. The natural productions of the Sudan are many and varied. Rubber and palm oil and kernels in the south of the western portion, gums from the desert confines, the manufactured leather and cloth, and even some slaves, from the central populous strip, are exported. Cotton goods, hardware, and iron and steel are the chief imports, most coming through the Guinea ports. The French railway from Dakar via Thiès, Kayes, and Bafoulabé on the

Upper Senegal to Bamako and Koulikoro on the Upper Niger, taps much of the trade of the Western Sudan, formerly reaching the Guinea coast or going northward across the desert. Caravans still cross the desert, starting from centres such as Timbuktu in French territory, at the northern bend of the Niger.

The Niger is an international waterway, whose chief trading centres, in addition to those mentioned above, are Idda, Asaba, Akassa, and other ports on the delta in Nigeria.

French West Africa, in the widest sense, reaches the coast in French Equatorial Africa, Dahomey, the Ivory Coast (*Côte d'Ivoire*), French Guinea, Senegal, and Mauritania, which extend a considerable distance inland, beyond which the greater part of the Sudan, west of the middle Niger, forms the colonies of the Upper Volta and French Sudan, and the Sahara west of the Tibesti Mountains and Lake Chad forms the Territory of the Niger. These territories are slowly being developed, and the older colonies now pay their way. The principal economic products are rubber (mainly from French Guinea), ground-nuts (from Senegal), rice, palm oil and kernels, and various tropical and subtropical fruits. Cattle-rearing is carried on by the tribes on the higher lands, and hides are exported. French Equatorial Africa is densely forested, and this prevents easy communication from Libreville, the chief port, to Brazzaville on Stanley Pool. In Dahomey a railway from Kotonu to Savé is being continued to Chaoru, on the Niger. Grand Bassam is the chief port on the Ivory Coast, from near which a railway has already been built to Bouaké. French Guinea includes the Futa Jallon Highlands,

where cattle are reared. A wharf has been built at Konakry, and a railway is completed through Kourassa on the Niger to Kankan. St Louis, the capital of Senegal, is joined by railway to the excellent port and fortified coaling station of Dakar at Cape Verd, and the Senegal River can be ascended in the rainy season to Kayes, from which a railway is built to Koulikoro to tap the trade of the upper Niger, and to Dakar *via* Ambidéli and Thiés.

The former German possessions of Kamerun and Togoland have been divided between Britain and France. In **Cameroon**, plantations of coffee, cacao, rubber, and tobacco have been made on the fertile slopes of the Cameroon volcano, where an experimental garden has been formed at Victoria. Palm oil, coco-nuts, and kola-nuts are also valuable products. Cattle-raising is carried on in the uplands. Yaoundé is the capital. From Douala, the leading port, railways have been built northward to Bare and eastward through Edea to Widimenge on the Nyong. In **Togoland** the forests supply valuable dye-woods, rubber, and palms; plantations of cacao, coffee, and coco-palms have been established. The chief trade is in palm oil and kernels and gum. In both colonies there are extensive areas where cotton-growing can be successfully carried on. From Lome, the capital and port of Togoland, railways run along the coast to Anecho, northward to Atakpame, and north-west to Palime.

Portuguese Guinea consists of the Bissagos (Bijagoz) archipelago and the land lying to the east; but more important possessions are the productive volcanic islands of St Thomas (São Thomé) and Principe in the Gulf of Guinea, yielding cacao, coffee, vanilla, quinine,

and rubber, and Cape Verde Islands, also volcanic, less liberally supplied with rain, but producing coffee.

The **Spanish Islands** of Fernando Po and Annobon resemble St Thomas.

Liberia is a negro republic between Sierra Leone and the Ivory Coast, exporting coffee, cacao, sugar, rubber, palm oil and kernels, and other forest products. Important concessions have been granted to a British firm of soap manufacturers for gathering and preparing the fruits of the palm. There are no roads in the country, and transport is performed by porters over native paths, which are frequently closed through tribal disputes. 'Labour is scarce and expensive, and it is probably the worst in the world.'

The **Anglo-Egyptian Sudan** extends south of Egypt to the northern frontiers of Uganda and the Belgian Congo, and from the Red Sea to the western limits of Darfur. In the north cultivation is confined to the narrow belt along the river-banks. From the palm groves of Dongola province dates are exported in large quantities to Egypt, and form one of the most remunerative crops. Dhura, the staple food of the natives, sown immediately after the annual inundation by the Nile, wheat, barley, ground-nuts, and castor-oil are also important products; these crops require irrigation, usually provided by Persian water-wheels worked by three or four pairs of oxen, enabling the water to be raised day and night.

On the lands watered by the floods of the Khor Baraka, which flows into the Red Sea, and by the River Gash, valuable cotton crops are raised, especially in the Tokar district.

The slopes of Darfur to the north of Bahr-el-Ghazal

have only a short rainy period, are arid, and gradually pass into desert. Gums are here the chief economic product, but much attention is now given by the nomadic Arabs to the rearing of cattle, either for transport purposes or to meet the demand for meat in the large centres of population.

In the Southern Sudan, between the Blue and the White Nile, stretches the vast Gezira plain, which has been proved to be admirably suited for the cultivation of cotton on a large scale. From the Makwar dam a great irrigating canal runs through the centre of the Gezira, where the railway facilities are being extended. The tropical reaches of the Upper White Nile, Sobat, and Bahr-el-Ghazal form great swamp-lands, which, when drained, are well adapted for the cultivation of rubber, rice, sugar, and other tropical products.

The Nile is navigable throughout this region from the foot of the falls at Lado to Khartum, but occasionally transport is interrupted by masses of vegetation—the sudd—which block the river; it has been suggested that the sudd could be used for fuel.

The railway from Wadi Halfa is continued southwards along the right bank of the Nile to Khartum; at Hillet Abbas the line crosses the river and runs westwards to El Obeid. From Atbara Junction a line has been built to Port Sudan and Suakin on the Red Sea. The Eastern Sudan is now controlled by Anglo-Egyptian authorities.

The Abyssinian plateau is high enough to have a temperate climate in its upper districts. Rain falls heavily in summer, and the flooded rivers carry away large quantities of the rich volcanic soil, to be deposited as fertilising mud on the plains of Egypt.

Tropical fruits, such as the banana, and vegetables, such as sweet potatoes and yam, can be cultivated in the tropical and subtropical valleys; and cotton, coffee, and sugar are also grown. Temperate fruits and cereals are grown at higher elevations. Barley yields the chief crop. Shepherding, however, for which the country is admirably suited, is the chief occupation, cattle, sheep, and goats being largely kept. The country is not yet developed in the European sense, and progress is hindered by bad roads and over-taxation. The ruler claims a tithe of such produce as ivory, coffee, beeswax, and musk. The imports are various kinds of manufactured articles. The French have built a railway from Addis Abbaba, the headquarters of the administration, through Harar, the eastern trade centre, to their growing port of Jibuti (*Fr. Djibouti*), nearly opposite Aden, at the entrance to the Red Sea.

NORTHERN SOUTH AMERICA.

Configuration and Economic Divisions.—South America north of 15° S. is bounded by the lofty Andes on the west. The east consists of the lowlands of the Amazon and Orinoco, with the Guiana Highlands and the northern portion of the Brazilian Highlands. It thus contrasts with Africa, the Congo basin lying from 1500 to 2000 feet higher than that of the Amazon. South America is more subject to oceanic influences than Africa, and has a smaller range of temperature and a greater rainfall. The forests of the Amazon and of the north-east coastal plains are even denser than those of the Central African valleys. They

abound in rubber, and yield much more timber, which is floated down the great rivers. The deltaic lagoons of the Guiana coast produce excellent sugar.

The Eastern Highlands and the lowlands farthest away from the equator, both with a marked dry season, are savana-lands. Cattle and horses are kept, especially on the llanos of the Orinoco. Coffee is cultivated in the south of the Brazilian Highlands and on the wetter eastern slopes of the Andes. The Andes are so high that products of every climate can be cultivated on their sides. The most important, in addition to coffee, cacao, and sugar round the base, is cinchona.

South America, like North America, is a continent of excellent waterways. The Amazon is navigable for 2300 miles from its mouth to Iquitos for ocean steamers, and for nearly 500 miles higher to Ackual Point at the foot of the Andes for vessels drawing 14 feet of water. Beyond this the Manseriche rapids practically arrest navigation, but occasionally a small steamer ascends them. All the great tributaries are also navigable for a considerable distance from the main river. A line of falls, which can be traced both south and north on any good map, separates the lower from the upper navigable reaches. The Madeira is the most important of the tributaries. The Orinoco and its tributaries, the Apure and Meta, are also navigable, so that the whole of the eastern slopes of the Andes are most economically reached by the great rivers. The Magdalena and Cauca are routes to the branching ranges of the Colombian Andes from the north. Few railways have yet been built. The eastern states of this region are Brazil; French,

Dutch, and British Guiana; and Venezuela. The western or Andean states are Colombia, Ecuador, Peru, and Bolivia.

Brazil is a vast country, larger than Australia or the United States without Alaska. It occupies the southern and eastern slopes of the Guianas, nearly all the lowlands of the Amazon basin with their dense wet jungle, and the Brazilian Highlands. The forests yield wild rubber, especially in the valley of the Madeira River, but the area from which it is obtained is gradually becoming more distant from the main streams, and some plantations have been laid out round Belém (Pará). Coffee is by far the most valuable product of Brazil, which furnishes three-fourths of the world's supply, mainly from the state of São Paulo. Cacao is largely cultivated in the northern states, and the country is now one of the leading sources of the world's production. Pernambuco is the chief centre of the sugar-cane culture. Increasing quantities of cotton are cultivated, mainly in the coastal states; over 90 per cent. of the textiles consumed are produced in the mills of Brazil. Rice is extensively grown in the valleys of São Paulo. Tobacco is an important crop in the northern Highlands and in Bahia. *Yerba maté* is widely grown and exported in large quantities, chiefly to Argentina. Cattle flourish on the opener campos. The districts to the south of São Paulo are being rapidly developed by stock and grain farmers of German, Italian, Polish, and other nationalities. Brazil diamonds were famous before those of South Africa were discovered. Gold is worked in nearly all the states, and rich copper deposits occur in Rio Grande do Sul, where smelting-furnaces have been

established. Brazil provides much of the world's supply of monazite, extensively used in the manufacture of incandescent mantles. Silver, manganese, and mercury are also obtained. Iron ores are known to exist (in Minas Geraes, Bahia, São Paulo, and other states), and are worked at Sabara and Itabara (joined by rail to the coast). Coal of an inferior quality is obtained in the southern states. Hitherto Brazil has been dependent upon imported coal for industrial purposes, but now increasing use is being made of the abundant water-power in the country, as a result of which important industrial developments are rapidly taking place. Among other schemes steps are being taken to supply electricity from the Piabanha Falls not only to Rio de Janeiro (the chief town and port), Nictheroy (with its important woollen and cotton factories), Petropolis (where the silk industry is carried on), and Mage, but also to the Central Railway of Brazil, and to the naval establishments on the islands in the beautiful and commodious harbour of Rio de Janeiro. From the capital many railway lines run across the plateau, one passing through the coffee districts of São Paulo to the port of Santos, from which much of the crop is shipped. Coffee is by far the most valuable export, forming 64 per cent. of the outgoing trade; hides and skins and cacao follow. Rubber now supplies only 2 per cent. of the exports. Manáos is the rubber-collecting centre for the Middle Amazon. *Yerba maté*, leather and hides, tobacco, cacao, cotton, and sugar are also valuable exports. The chief imports are manufactured goods of all kinds, iron and machinery, coal, wheat and flour, jerked beef, wines, and other foodstuffs. The chief trade is with the

United States (the exports being about equal in value to the imports), Great Britain, and Argentina.

The **Guianas** produce sugar, cacao, coffee, bananas, rice, mahogany, rubber, coco-nut, gold, and some diamonds. Georgetown, the capital of British Guiana, is the most important centre.

In **Venezuela** coffee is the staple crop, cacao and sugar ranking next. The slopes of the mountains are cultivated with tobacco, cotton, rice, and, at higher levels, barley. Rubber, excellent timber, and many valuable tropical products, such as copaiba balsam and vanilla, are produced in the forests. Cattle are kept on the vast savanas of the Orinoco, and frozen meat is now exported from Puerto Cabello. Gold is found in the east of the Guiana Highlands. Copper, silver, and iron are plentiful. Coal is obtained at Naricual and at Coro. Important petroleum deposits in the vicinity of Maracaibo supply the local demand for illuminating and lubricating. The chief town is Carácas, only eight miles from its port of La Guaira, which is reached by a railway twenty-two and a half miles long, which zigzags over the mountains. From Carácas lines also run to Santa Teresa and Valencia, which is connected with Puerto Cabello. Of the other short lines the most important are from Tucacas to Aroa, and to Barquisimeto, and from Encontrados to La Uraca. Maracaibo exports coffee, cacao, and sugar from the districts around the lagoon of the same name, at the mouth of which it is built. Rubber and balata, chiefly from the upper Orinoco and the Rio Negro, and hides are also important exports. The Orinoco is an excellent route to the interior at present very little used. Venezuela is comparatively healthy for

Europeans, but its population is too small for rapid development.

Colombia, Ecuador, and Peru are situated in the western Cordilleran area. The great impediment to their development is the difficulty of transport.

In **Colombia** there are less than 900 miles of railway, and the roads are generally simple mule-tracks. The Magdalena, which is being partly canalised, is the most important means of transport. The mineral wealth is considerable. Coffee, platinum, and bananas are exported; gold, silver, copper, lead, cinnabar, and emeralds are mined. Petroleum and asphalt are found. Coffee, sugar, cacao, and tobacco are grown, and within recent years banana cultivation has become important. Rubber is a valuable export. The imports are manufactured goods of every kind. Bogotá, the capital, lies on a lofty plateau. Medellin is the centre of the mining province of Antioquia. Barranquilla, near the mouth of the Magdalena, and Puerto Colombia are the outports of that river-basin. Cartagena at present dominates the western trade. The opening of the Panamá Canal has improved the commercial relations of the Pacific states of Colombia.

Ecuador is even more backward in respect of means of communication. Cacao is the leading agricultural product and principal export from Guayaquil, the chief port. Rubber, coffee, and sugar are also cultivated. Minerals are abundant, but little worked. Cacao, ivory-nuts, and coffee are the leading exports; while manufactured goods and foodstuffs are the chief imports. The manufacture of Panamá hats is extensively carried on, and they form one of the

principal exports. Most of the rivers are navigable on their lower courses for small craft. A railway connects Durran and Quito, the capital, built on a lofty plateau; another line runs from Puerto Bolivar to the cacao districts.

Much of western Peru is a rainless desert, fertile where irrigated by water from the many rivers from the Andes. Cotton, coffee, and sugar are the chief agricultural products. The cultivation of cotton is being extended under irrigation. Coffee and cacao are grown on the eastern slopes of the Andes. Sugar and rice are extensively cultivated in the coastal region. Coca is a valuable product in the Otuzco district, and cocaine is manufactured at Lima, the capital of the country, and at Callao, the chief port, from which large quantities are exported. Other medicinal plants, including cinchona or Peruvian bark, dye-woods, and rubber are obtained in the tropical forests. Wool is obtained from the sheep, llama, and the alpaca goat, and exported in considerable quantities. The country is very rich in minerals, of which copper is at present the most important, but better transport facilities are necessary for their further development. The output of petroleum from the Lobitos and Negritos is increasing. The leading mining centre is Cerro de Pasco, which is connected by railway with Lima and Callao, through Oroya, from which point a line is under construction to Ayacucho. A line runs northwards along the coastal belt from Lima to Huacho, and a railway runs from Mollendo, on the coast, to Puno and Cuzco. Most of the trade of Peru is done with the United Kingdom, followed by the United States and Chile.

Bolivia consists of a plateau, the eastern ranges and slopes of the Cordilleras, and the lowlands at their foot. It is a rich mineral country, especially in the Cordillera region. Large quantities of silver are produced, the mines at Potosi having long been famous. Bolivia now ranks as the second tin-producing country in the world, and furnishes over 20 per cent. of the total supply. Oruro, to the north of Lake Poópo, is the chief centre. Bismuth and copper are important, and lead, zinc, antimony, and some gold are also worked. The eastern provinces produce coffee, cacao, sugar, tobacco, and fruits. The forests yield abundant timber, Peruvian bark, and rubber, the bulk of which is exported down the Madeira River. Cattle-rearing is important on the plains; great numbers are annually sent to the Argentine or driven across the Andes to the ports of Chile. Bolivia has no seaboard, and its traffic is carried through the adjacent countries by the eastern rivers, or across the mountains to the Pacific ports. La Paz, the capital, is connected by rail with Arica, and, through Lake Titicaca, with Mollendo; while the principal line in the country runs from the capital, through Viacha and Oruro, to Uyuni, where it divides, one line reaching the coast at Antofagasta, the other joining the Argentine system. Branches link Cochabamba and Potosi with this main line. An important railway along the right bank of the Madeira, from Guajara Mirim, on the Rio Mamore, to S. Antonio, carries trade past the unnavigable falls of that river, and opens up a rich agricultural district. The chief customers of Bolivia are the United Kingdom, the United States, and Argentina. Minerals, especially tin and silver, form the most val-

able exports; then rubber, cacao, cattle, and hides. The imports mainly consist of foodstuffs and manufactured goods, including railway stock.

CHAPTER XIV.

INSULAR AND PENINSULAR LANDS BETWEEN THE TROPICS

(*Excluding Peninsular India*).

THESE differ from the regions described in the last chapter in being islands, and not parts of vast continents. Oceanic influences are all-important. The temperature is uniformly high, and differs little from day to night or from season to season, and the rainfall is usually high.

The East Indies are the insular equivalents of the Congo and Amazon basins. The West Indies and the Philippines, lying nearer the tropic, are the insular equivalents in the northern hemisphere of tropical Queensland.

In the East Indies the native population is large and at different stages of civilisation. In the West Indies the native population has been exterminated and its place filled by negroes of African descent. The West Indies and the northern Philippines can be settled by whites, but cultivation is entirely carried on by native labour. The exports are tropical timber, fruits and other agricultural products. Cottons and hardware are the chief imports.

THE INDO-CHINA PENINSULA.

The Straits Settlements consist of the islands of Penang and Singapore; Wellesley, the Dindings (partly insular), and Malacca on the Malay Peninsula; and the Federated Malay States, under British protection, of Perak, Pahang, Selangor, and Negri-Sembilan, to which must be added the five unfederated states of Johore, Kedah, Perlis, Kelantan, and Trengganu. The centre of the Malay Peninsula is traversed by a mountain-range, from 3000 to 6000 feet high. It is colder and wetter (100 to 200 inches per annum) on its upper slopes than nearer the coast; but everywhere the climate is equable, with cool nights. Rainy seasons occur over the whole region when the sun is at the zenith, and in the east there is also a rainy season when the north-east trades prevail. The forests produce gutta-percha, rubber, resin, rattans, and excellent dye-woods and hard timbers, especially between 1000 and 2000 feet above sea-level. Cattle are reared for draught purposes. Tin is the most valuable mineral product of the Malay Peninsula, which is the chief source of the world's supply.

The native Malays are hunters and collectors of forest produce. There has been a remarkable development of the rubber industry since 1907. During the four years ending 1910 the weight of the rubber exported increased more than six times. It is now about 300,000 tons. Most of the agriculture and mining is done by Chinamen and Tamils from southern India. Sugar and rice are grown in large quantities.

A railway of metre gauge, running parallel to the coast from twenty-five to fifty miles inland, connects Perlis with Singapore. Branches are built to meet the trunk-line from the coast at Penang and Malacca in the Straits Settlements, Port Weld and Teluk Anson in Perak, Port Swettenham in Selangor, and Port Dickson in Negri-Sembilan. An important branch also runs to Kuala Lipis, in the centre of the peninsula. Singapore has been connected with the mainland by a causeway carrying rails. Tin and spices are the chief exports.

Penang and Singapore are the chief commercial centres and ports of call for steamers passing through the Malacca Straits. Singapore is one of the greatest 'shipping junctions' in the world. It is a free port, in regular communication with Japan and China in the north-east, the Malay Archipelago and Australia in the east and south-east, with India and, by the Suez Canal, with Europe in the north-west, and with South Africa and with Europe by the Sunda Strait in the south.

Siam is a mountainous land with alluvial plains occupying the basin of the Menam, and having under tribute the states in the middle part of the Malay Peninsula. It has a monsoonal climate. The most important product of its damp, fertile, alluvial plains is rice; of the dense forests which cover much of the country, teak. Coal, iron, and tungsten are found, and tin-mining is steadily developing. Rice, teak, and hides are the chief exports, and cotton goods and yarn, metal manufactures, foodstuffs, and sugar the chief imports. Bangkok, the capital, is the trading centre on the Menam. Rivers and canals

are the chief means of communication, but railways are extending. From Bangkok a line follows the left bank of the Menam to Chiengmai; another runs north-east to Korat, another east to Petriu, and a fourth goes south-west through Petchaburi to join the Federated Malay States line, and give through express service between Bangkok and Singapore.

Great Britain now exercises suzerain rights over Johore and the Siamese Malay States of Kelantan, Trengganu, Kedah, and Perlis, thus establishing British protection from the Persian Gulf to the Gulf of Siam. A line has been constructed through this territory to connect the railway systems of Siam and the Federated Malay States. Rubber estates are numerous, and rice, coco-nuts, and betel-nuts are widely grown and exported. Gold and tin are found. Cattle are reared, and the natives along the coast are expert sailors and fishermen.

French Indo-China consists of Cambodia, Cochin-China, Annam, Tongking, Laos, and the French territory in China at Kwangchow east of the Leichow peninsula. The Mekong River runs along part of its western margin, and will form an important route to a yet practically unopened land. The hilly land to the east is well wooded, and supplies teak, camphor, and rubber. Coco-nuts grow round the coast, and the Mekong, Red River, and other deltas are fertile if unhealthy regions, producing much rice, sugar, maize, and cotton. The narrow Annam coast is less fertile, and fish form the chief food of the inhabitants. Coal is mined in Annam (near Tourane) and at Tongking (at Hongay and Kebao).

Saigon, east of the Mekong delta in Cochin-China,

is the chief port in the south; Hué, in Annam, is the leading town in the centre; Hanoi and its port, Haiphong, are the chief places of Tongking. Railways run from Saigon to Mytho, and to Nha Trang in Annam. An important line accompanies the Red River from Haiphong to Lao-Kai and into Yunnan (China). From Hanoi there is a line north into China *via* Lang-Son, and another south to Vinh. Tourane is connected by rail with Kwang-tri and with Tourane.

The chief trade is in rice, exported to the Philippines, Hong-kong, and China, as well as to France. Pepper, fish, hides, tin and coal, cotton, sugar, and rubber are also exported. The imports of manufactured goods come mainly from the United Kingdom, United States, and Japan.

THE EAST INDIA ISLANDS.

Except Borneo and Celebes, most of these mountainous islands are volcanic. The soil is fertile. Always hot, and almost always wet, they are covered with rich forests on the plains and in the valleys, with open woods and savanas on the higher ground. The coastal lands produce coco-nuts, and the low lands rice, rubber, bananas, and tropical fruits, sago, bamboo, and many useful timbers. Coffee, tobacco, and sugar are cultivated.

The Dutch East Indies form the most important part of the East India Islands. They consist of Sumatra, Java, part of Borneo, Celebes, the Moluccas, the western part of New Guinea, and the smaller Sunda Islands, with the exception of the eastern part of Timor, which is Portuguese. Java, although not the largest, is the most important of these possessions,

and a brief account of it may be applied with modifications to most of the others.

Java is a volcanic island about the size of England, with a uniformly high temperature and an abundant rainfall, which is heaviest in the south and west. Its rich soil is very fruitful, and is carefully irrigated, drained, and cultivated, so that this 'garden of the East,' although a purely agricultural country, supports a population resembling in density that of England. A quarter of the land is cultivated. Rice and maize occupy the greatest area. Sago is found in the west, and coco-nuts round the coast. Above the plains coffee, tea, cacao, sugar, soya beans, tobacco, indigo, and cinchona are cultivated. Coffee, tea, and cinchona are of especial importance. Java exports large quantities of copra, rubber, coffee, and tea, and it is by far the most important source of quinine. The forests contain many valuable trees, such as teak, bamboo, camphor, and rubber. The higher grasslands support many cattle and buffaloes, whose hides form an important export. Tin, oil, and coal are the chief mineral products.

The leading port is Batavia, from which a railway runs to all the chief centres of the island.

Sumatra is more extensively covered with dense forests. Coffee and tobacco are cultivated; coal is worked at Ombilin. Its chief ports are Padang and Benkulen on the west coast.

Banka, Billiton, and Riouw have rich tin-mines.

Dutch Borneo and **Celebes** are also largely covered with forest, but are cultivated here and there, coffee being the chief export crop.

The **Moluccas** have long been termed the **Spice**

Islands, and are noted for pepper, nutmeg, and cloves, the last named coming chiefly from the small island of Amboina, to which at one time the Dutch confined their cultivation.

The trade of the Dutch East Indies is mainly with the Netherlands.

British Borneo consists of the north-western protectorates of Sarawak and Brunei and the northern lands of the British North Borneo Company. Coconut, coffee, tobacco, rubber, Manila hemp, tapioca, pepper, and gambier plantations have been formed; sago and rice are grown for food; raw forest produce (especially timber, rubber, and wax), bêche-de-mer or trepang, and edible birds'-nests, are the chief natural productions. The mineral wealth is unexploited, but includes coal, iron, gold, and oil. A short railway runs inland from Jesselton on Gaya Bay to the interior, with a branch to Weston on Brunei Bay. Sandakan, in the north, Jesselton and Kuching, the capital of Sarawak, in the south, are important centres. Trade is largely with Singapore.

The **Territory of Papua** (British New Guinea), lying off the north of Queensland, is politically attached to the Australian Commonwealth. The country is densely forested and little opened up. Coco-nuts grow round the coasts, the sago-palm is abundant, and some rubber, coffee, tobacco, sisal hemp, and cotton are cultivated. Copper and gold are mined, and petroleum has been found. Port Moresby is the chief centre and port.

The **Territory of New Guinea**, formerly German New Guinea, lies to the north of Papua, which it resembles in its productions, its possibilities, and its present

almost unexploited condition. Gold occurs in the Bismarck Mountains. The plantations include coco-nut, cacao, tobacco, rubber, and coffee. Madang is the chief port. The Territory, along with the Bismarck Archipelago to the immediate east, where the administrative centre is situated at Rabaul in New Britain, and the Solomon Islands, was assigned (1920) to Australia under mandate of the League of Nations.

The Philippines were formerly Spanish, but now belong to the United States. They lie between 4° and 20° N., and consist of many islands, of which the largest is Luzon, which is mountainous; while Mindanao, the next in size, is at present less important commercially than the smaller Visayan islands of the centre of the archipelago. The eastern slopes receive rains from the north-east trade-winds, the maximum falling in the northern winter; the western slopes receive rains from the south-western monsoons which blow during the northern summer.

The mountains are covered with valuable forests; the sea-coasts produce coco-nut palms. The valleys, especially that of the Cagayan, famous for its tobacco, and that between the bays of Manila and Lingayen, are cultivated. Rice is the chief food crop, but it pays to import rice from Cochin-China. Tobacco, Manila hemp, coco-nut, and sugar are the most important articles grown for export. The islands now provide about one-fourth of the world's supply of copra. Much of the tobacco is rolled into cigars at Manila. Many minerals occur, and are being slowly developed. A railway runs from Lingayen, through Manila, to Batangas, in Luzon; there are lines in Panay, Negros, and Cebu islands.

PACIFIC ISLANDS.

The intertropical isles of the Pacific are either low coral atolls with coco-nut palms, or volcanic islands, which in many cases are girdled with coral-reefs. The temperature is constant and warm, the rainfall as a rule sufficient, and the volcanic islands especially fertile. Copra is the most important product in all the islands, but sugar is cultivated in Fiji, Samoa, and Hawaii, where bananas, rice, maize, coffee, cacao, and even tea are also grown.

It is hardly necessary to enumerate all the islands. The Tonga, Fiji, and many smaller islands are British. The most fertile of the Samoan islands are under mandate to New Zealand. France owns Tahiti. Britain and France prevent each other from controlling the New Hebrides. The Hawaiian Islands, part of the United States of America, are the most important group, and with Guam and the excellent Samoan harbour of Tutuila give the chief strategic positions in the Pacific islands to that country. Honolulu in Hawaii, Apia in Samoa, and Suva in Fiji are the most important commercial centres.

New Caledonia, a French island of a very different type, lies between New Zealand and New Guinea. It has a mountainous axis, in which nickel, cobalt, copper, and chrome ore are found, and on whose sides are dense forests. Coffee, maize, tobacco, sugar, and practically all tropical products can be cultivated. Minerals, coffee, copra, rubber, guano, and preserved meats are the chief exports. The trade is chiefly with France. Nouméa is the chief port, and a railway is built from it to Paita in the interior.

THE WEST INDIES.

The West Indies consist of the Great Antilles—the four large islands of Cuba, Jamaica, Hispaniola (divided into Haiti and Santo Domingo), and Porto Rico—the low coralline Bahamas lying north-west of Cuba and mainly north of the tropic, and the Lesser Antilles stretching north and south at their eastern extremity between 10° and 20° N. With the exception of Barbados, which is a low island of coral limestone, the Antilles are mountainous, most of the Lesser Antilles being volcanic.

Climate.—Considerable differences of temperature are found at different heights within a small area, but everywhere the daily and seasonal variations are small. The heat is tempered by a sea-breeze during the day, and by a hill-breeze during the night.

The trade-winds prevail at all seasons over the West Indies. February and March are the driest months. There are two rainy seasons, the rainfall being heaviest in May and October in the north, and a month or more later in the south, and in Trinidad there is one maximum in August. The eastern and northern sides exposed to the winds are the wettest.

Products.—The windward sides of the islands are wetter, cooler, and more densely wooded than the leeward sides. The forests produce mahogany, ebony, and other cabinet hardwoods, and valuable dye-woods. Wide stretches of savana are found in the upland regions. Sugar-cane and cotton are the principal crops in Barbados, Antigua, and St Kitts, and in almost all the islands. The cultivation of cacao and

of the banana, pine-apple, and other tropical fruits for the United States and British markets is being extended. Cuba is famous for tobacco. Cotton-growing is now an established industry on many of the islands. Sugar, rum, and cigars are the chief articles manufactured.

Trinidad is a square island with three peninsulas, two formed by the northern and one by the southern mountains. The rainfall is heavy from June till December. Cacao is now the most valuable and most widely cultivated product. The cultivation and manufacture of sugar is in the hands of a few large capitalists. The coco-palm thrives along the sandy shores of the south and east, and about 20,000,000 coco-nuts are annually exported. Tropical timber and dye-woods are also valuable products. Increasing attention is being given to the cultivation of oranges, bananas, and rubber. In the south and south-east of the island petroleum is obtained and refined, and a large pitch-lake supplies asphalt, which is exported, in addition to cacao, sugar, coco-nuts, and Angostura bitters. Coolie labour is employed, most of the overseers being British. Port of Spain, the capital and chief port, is connected by railway with Sangre Grande, San Fernando, and Princes Town.

Barbados has a climate similar to that of Trinidad. Sugar was formerly the only crop, and it still remains the most important; but in 1902 the cultivation of Sea Island cotton was re-established, and is extending. Small quantities of maize, arrowroot, and sweet potatoes are grown for local consumption. The Chinese or dwarf banana industry had attained considerable importance by 1914, but owing to the lack

of adequate shipping facilities it has declined. Boring operations for petroleum are in progress. The agriculture is carried on by negroes, who form the bulk of the dense population and own most of the land. From Bridgetown, the capital, a railway runs eastwards and along the east coast.

The British Windward Islands are Grenada, St Vincent, and St Lucia. Grenada grows cacao and some spices and cotton. In St Vincent the cultivation of sugar, which was formerly the principal product of the island, has suffered much in recent years through hurricane and eruption, and consequently the output is now small. The planting of Sea Island cotton was started in 1904, and now forms the leading industry in the island. Arrowroot is an important crop, and rum, molasses, cacao, and spices are also exported. Live-stock are raised. St Lucia exports sugar and cacao from Castries, one of the best harbours and one of the principal ports of call in the West Indies.

Sugar is the most important product of the British Leeward Islands—i.e. those of the Lesser Antilles from Dominica northwards which are British. The cultivation of cotton is carried on in all the islands except Dominica. Dominica presents a marked physical contrast to Barbados. It is very mountainous and volcanic; but in spite of its fertility, only one-twentieth is cultivated. Lime juice and lime products and cacao are the principal exports; oranges, vanilla, and rubber, and most subtropical products, can be grown. There are few good roads. Roseau is the capital. Cotton, limes, and sugar are the chief products of Montserrat; sugar and cotton are the principal

crops in **St Kitts** and **Nevis**; and sugar is the leading export from **Antigua**, but cotton, pine-apples, and onions are also grown and exported.

Jamaica is an elliptical island which consists of the Blue Mountains in the east, separated by a valley from the limestone plateau of the west. It is hot in the lowlands and cool on the mountains. Rain falls in the summer months, and most abundantly in the east and north.

The limestone region is bare in many places. The alluvial lowlands are the most fertile part of the island. Cattle, sheep, horses, and mules are fed on the pasture-lands.

Bananas are by far the most valuable crop. Next come sugar and its products, which formerly held the leading place among the exports from the island, but have decreased in importance in recent years, and now form about 20 per cent. of the total exports, while fruits (mainly bananas, oranges, and grape-fruit) provide over 55 per cent. of the export trade. Coffee is cultivated all over Jamaica, the most valuable being grown on the Blue Mountains. Cacao, allspice or pimento, logwood, coco-nuts, ginger, and other spices are also important exports.

Railways join Kingston, the capital, to Port Antonio and Montego Bay on the north coast.

The United States and the United Kingdom control about 80 per cent. of the total trade. The former country takes about half of the exports and supplies over half of the imports; the share of the latter is about one-third under each head. Jamaica owes its prosperity to the variety of its products. Reliance on sugar alone has long been given up. The breaking up of

large estates into small properties cultivated by their owners has added to the wealth of the island.

In the **Turks and Caicos Islands**, which, although geographically connected with the Bahamas, are dependencies of Jamaica, the production of salt from sea-water by solar evaporation is an important industry; the bulk of the produce is shipped to the United States.

The **French West Indies** consist of volcanic Martinique, where disastrous eruptions destroyed the northern half of the island and killed over 30,000 people in 1902; and the half-volcanic, half-limestone Guadeloupe, both densely peopled, and producing, in addition to sugar, pine-apples, bananas, cacao,^{*} coffee, tobacco, and cotton.

The Dutch own several small islands, of which Curaçao, famous for a liqueur made from the orange, is the most important. It lies off the South American coast.

In the **Virgin Islands**, purchased by the United States from Denmark in 1917, St Croix is the strategic key to the eastern part of the West Indies; sugar-cane is the most important crop.

Porto Rico, formerly Spanish, now belonging to the United States, is very fertile, producing sugar, coffee, tobacco, fruits and nuts, and cotton, which, along with hides, form the leading exports. These are cultivated by peasant proprietors, the majority of whom are of Spanish descent. The change in political ownership was followed by tariff modifications, which have diverted the trade of Porto Rico to the United States.

Santo Domingo, the eastern half of Hispaniola, is peopled by Spanish mulattoes, who cultivate sugar, tobacco, cacao, coffee, and bananas. **Haiti**, the French-

speaking negro republic occupying the west of the island, produces timber, especially logwood, cacao, coffee, cotton, and sugar. Minerals are undeveloped.

Cuba, the largest of the Antilles, lies just south of the Tropic of Cancer. The east is the wettest region. The slopes of the Sierra Maestra are covered with forests, in the clearings of which coffee is grown, but only enough to supply one-fourth of the local demand. Bananas, pine-apples, citrus-fruits, coco-nuts, and rice are grown in the lowlands, and cattle feed on the rich grass-lands. The central regions are very suitable for sugar-canies, and within recent years the sugar industry has made steady progress, the bulk of the output being shipped to the United States. Much of the tobacco, of which the famous Havana cigars are made, is grown on the southern slopes of the Organos Mountains, in the west; in 1919 over 135,000,000 cigars were exported. The cigar boxes are made from local cedar wood; mahogany is exported. Turpentine is prepared from trees grown in the Isle of Pines.

Cuba, along with all the sugar-growing islands in the West Indies, annually imports large quantities of jute-bags, mainly from Calcutta; but henequen is cultivated, and many fibrous plants grow wild in the country, and it is intended to undertake the manufacture of sugar-bags in order to meet the large local demand.

Cuba possesses valuable mineral resources—copper, iron, manganese, and asphalt being found in large quantities; at present only the iron is being worked to any considerable extent. Over 600,000 tons of ore are annually exported to the United States, mainly from the Juragua and other mines in the Sierra

Maestra, in the province of Oriente. Small quantities of copper and asphalt are also exported.

There are over 3000 miles of railway in the country, the system running through the centre of the island, and passing through the sugar and tobacco regions, with branches to the chief ports.

Havana, the capital, and Matanzas on the north coast, and Cienfuegos on the south, are the chief ports in the western half of the island. Santiago is on a magnificent harbour in the south-east. Guantanamo is a United States naval station. The trade is mainly with the United States, which takes over 80 per cent. of the exports and contributes three-quarters of the imports. The United Kingdom takes less than 12 per cent. of the total exports from Cuba, and sends less than 3 per cent. of the imports, consisting chiefly of cotton goods, rice, and hardware.

CENTRAL AMERICA.

Central America lies between the isthmuses of Panamá and Tehuantepec. A series of volcanoes runs parallel to the Pacific coast, and in the east several ranges extend from west to east. The peninsula of Yucatan is flat. The long rivers flow eastward to the Atlantic.

Three climatic regions can be distinguished—the lowest or hot region (*tierra caliente*), the middle or temperate region (*tierra templada*), and the highest or cold region (*tierra fria*). Most rain falls on the eastern slopes, where the normal zenithal rainy season is supplemented by rains during the north-east trades.

Products.—The hot regions of the eastern side are

covered with thick forest of valuable timber and dye-woods—such as mahogany and logwood—and rubber. The forests are much less dense and important on the drier western slopes, and give place to open savanas, on which cattle are fed.

The most valuable crops are coffee (especially in Guatemala, Nicaragua and Costa Rica), bananas (extensively cultivated along the Atlantic coastal belt in Panamá, in the valley of the Escondido River in Nicaragua, and in Honduras, where they furnish 40 per cent. of the exports), sugar, tobacco, maize, cacao, coconuts, ivory nuts, and rice. The cultivation of cotton is carried on in Salvador and Nicaragua. Balsam of Peru is cultivated along the coast of Salvador to the west of La Libertad, and indigo is also an important product. In Costa Rica bananas were originally planted in order to afford shelter to the coffee-trees, but they are now cultivated as an independent crop; over 8,000,000 bunches are annually shipped to New Orleans, New York, Boston, and the United Kingdom. Chicle for chewing-gum is sent to the U.S.A.

The republics are rich in minerals, but no attempt has yet been made to develop the resources on an extensive scale. Gold is mined in Honduras, Nicaragua, Costa Rica, Guatemala, and Panamá; silver in Honduras, Nicaragua, and Guatemala. Iron, coal, and oil are also found in several of the countries, and the pearl-fisheries are important.

British Honduras exports mahogany and logwood, which, with bananas and rubber, are the staple exports from all the east-coast ports of Central America—Limon, in Costa Rica; Greytown, or San Juan del Norte, and Blewfields, in Nicaragua; Puerto Barrios,

in Guatemala; Belize, in British Honduras; and Colon, in Panamá.

Coffee, bananas, cacao, forest products, gold and silver, cattle, and hides are the chief exports from the western ports, which are the most important. The ports are Puntarenas, in Costa Rica; Corinto, in Nicaragua; Amapala, on Fonseca Bay, in Honduras; La Unión, the port of Salvador; San José and Champerico, in Guatemala; and Panamá, on Limon Bay.

The narrow isthmuses of this region permit easy communication between the Atlantic and the Pacific. Several interoceanic lines have already been built; in Guatemala from Puerto Barrios through the capital to San José de Guatemala on the Pacific; in Costa Rica from Limon to San José; and in Panamá from Colon to Panamá. In Nicaragua a railway passes from Corinto, the principal Pacific port, through Leon to Managua and to Granada, on Lake Nicaragua, from which the San Juan flows to the Atlantic. In Honduras, a line runs from Puerto Cortes to Potrerillos. A line connects Ocos, one of the Pacific ports in Guatemala, with Ayutla, on the Mexican frontier, and from Champerico a line passes through a coffee-growing district to the capital.

A canal, fifty miles in length, has been cut across the isthmus of Panamá from Colon to Limon Bay, the United States having acquired the territory extending for five miles on either side of the canal, although the towns of Colon and Panamá retain their own administration. By the construction of a huge dam at Gatun the valley of the River Chagres, which brings down great quantities of silt and boulders during the heavy

flooding of the rainy season, has been transformed into a great lake, 23 miles in length, and with an area of 164 square miles. Across the Cordilleras, which separate the Gatun Lake from the Pacific, the Gaillard cut has been excavated for a distance of nine miles. At Colon and Panamá large coal depôts and oil-tanks have been established. To what extent the new canal will affect international commerce and alter the established trade-routes must depend, in a considerable degree, upon the tolls imposed upon shipping using the canal, upon the possibilities of obtaining cheap bunker fuel, and of obtaining a return cargo. The United States will naturally gain most by the opening of the canal, for not only will the distance from New York to San Francisco be reduced by over 8000 miles, but the voyage to Japan and China, with their rapidly expanding markets, will be much shortened. The United States will also be brought into direct communication with the Pacific coast of South America, and with the markets of Australia and New Zealand. Some effects of the canal are shown in the following table of distances:

To	From Liverpool.		From New York.	
	Present Route.	Via Panamá Canal.	Present Route.	Via Panamá Canal.
Vancouver.....	14,570	8,647	14,160	6,089
San Francisco.....	13,770	7,847	13,360	5,289
Valparaiso.....	9,000	7,185	8,590	4,627
Wellington.....	11,981	11,058	11,570	8,857
Yokohama.....	11,678	12,372	13,566	9,798

MEXICO.

Configuration.—Mexico extends from 15° to 32° N., but, although the northern portion is outside the tropics, it will be convenient to consider the whole

country here. It consists of a plateau, rising from north to south, where it is called the Anahuac Plateau, with an average elevation of 5000 to 7000 feet. This plateau is bordered east and west by mountain-ranges, the Eastern and Western Sierra Madre, at whose base a narrow coastal plain fringes the ocean. The southern parapet of the plateau is a region of lofty volcanic mountains, which tower above the Tehuantepec isthmus, beyond which the greater part of the limestone peninsula of Yucatan is still in Mexican territory. The republic also includes the peninsula of Lower California, traversed longitudinally by an irregular range of mountains.

Climate and Vegetation.—Except in the north, northwest, and centre, where it is very dry, the climate and vegetation of Mexico resemble the conditions of Central America, and the three zones, *tierra caliente*, *tierra templada*, and *tierra fria*, are all found, the last two in greater proportion than farther south. Lower California is semi-arid.

Economic Productions.—As a result of its latitude and elevation Mexico possesses a wide range of economic plants. In the low-lying hot lands and the lower slopes of the plateau, tropical and subtropical vegetation flourishes, including cacao, rice, coffee, bananas, sugar-cane, coco-nuts, cinchona, and vanilla. At greater altitudes temperate plants are cultivated, including wheat, maize (which is found at an elevation of over 7000 feet), and tobacco. On the limestone soils of Yucatan and throughout the drier regions of Mexico valuable fibre-yielding plants (henequen, or sisal-hemp, and ixtle) are grown, from which ropes, cordage, and paper are made; from the maguey, or American aloe, in addition

to the fibre, a juice is extracted from which an intoxicating drink is fermented. On the grassy savanas and in the semi-arid region of the north live-stock are reared, especially goats and cattle. The forest products of Mexico are of great importance, the most valuable being rubber, fine woods, such as mahogany and cedar, logwood and other dye-woods.

Mexico is exceptionally rich in minerals, especially in petroleum (produced in the hinterland of Tampico and Tuxpan), silver (mined chiefly at Guanajuato, Zacatecas, and San Luis Potosi), gold (found mainly on the Pacific slopes), sulphur (from the crater of Popocatepetl), marble, zinc, mercury and precious stones, copper and iron. The production of petroleum has increased over ten times between 1912 and 1921.

Iron-foundries and steel-works are in operation at Monterey and Chihuahua; cotton-mills at Puebla, Leon, and Guadalajara; woollen-mills at Aguascalientes. Sugar-mills, distilleries, potteries, and tobacco-factories are widely distributed, but are usually on a small scale.

Trade, Routes, and Towns.—Minerals, tropical products, fibres, and animals are the chief exports; manufactured articles of all kinds, machinery, and coal are the chief imports. Trade is carried on chiefly with the United States; next with the United Kingdom, Germany, and France.

The chief ports are Vera Cruz and Tampico (where much of the silver is shipped) on the Gulf of Mexico, and Mazatlan (wheat), Manzanillo, and Acapulco on the Pacific. From La Paz, on the Gulf of California, fruits are exported; a harbour is now established at Ensenada on the Pacific coast of Lower California.

From Mexico, the capital of the republic, railways run northwards to the United States frontier, on the eastern side of the country through San Luis Potosi and Monterey, in the centre through Leon and Chihuahua, and through Mazatlan and Guaymas on the western side. From the capital lines pass westwards through Colima to Manzanillo on the Pacific coast, southwards through Puebla to Oaxaca, eastwards to Vera Cruz, and south-east to join the railway which crosses the republic from Puerto Mexico (formerly Coatzacoalcos) on the Gulf coast to Salina Cruz and Tapachula on Tehuantepec Bay. The railway system is being completed along the coastal belt from Vera Cruz and Tampico to Matamoros.

CHAPTER XV.

EASTERN ASIA.

THE east coast of Asia, from the island of Hainan to the north of Yezo, lies between latitudes corresponding to those of Australia between the south of the Gulf of Carpentaria and the south of Tasmania. The physical and economic conditions, however, are very different. The eastern mountains do not form so continuous a barrier as in Australia, but stretch parallel to the coast south of 30° , and from Korea northward. A great plain extends from 30° to 40° N., with the mountains which form the Shantung peninsula rising above it in the east. In the south-west the land rises to lofty mountain-ranges and steep valleys, forming the eastern bulwarks of the Tibetan plateau, whose valleys lie two and a half miles above the sea. The

northern plains are bounded by steep escarpments, beyond which stretches the desert plateau of Mongolia, between 3000 and 4000 feet above sea-level. Off the east coast are the East China Sea with its shallow northern gulf, the Yellow Sea, and the Sea of Japan, with islands to the east of them. Formosa in the south, and the Japanese Islands in the north, are represented in the southern hemisphere by New Caledonia and New Zealand, both of which, however, lie much farther from the mainland. In addition to these differences in configuration, there are important differences in climate.

Climate.—The climate of Eastern Asia is one of great extremes, except in the very south. Even in the Japanese Islands the mean temperature varies from 75° to 40° F., and the mean range is from 20° in the south to 70° in the north. The summers are everywhere warm, with a temperature of over 80° in the south, and over 60° in the north. In winter, while the temperature does not fall below 60° on the southern coasts, it is as low as 0° in the north. Much lower winter temperatures, therefore, are experienced than in similar latitudes in the south of Australia.

The east of Asia, like the east of Australia, has its maximum rainfall during the summer months, except on the western coast of Japan, which receives heavy rains from winter storms blowing across the Sea of Japan. These winter rains affect all the southern Japanese Islands, and make the climate of Japan, which has a well-distributed rainfall, very different from that of China, where the rainfall is almost entirely confined to the summer six months.

The summer rains of Eastern Asia, like those of Australia, are due to winds which blow from the ocean to the continent; but whereas in the case of Australia these winds may be considered as the normal trade-winds intensified, in the case of Eastern Asia they are comparable with the monsoons of India. The cold, invigorating winter climate of Eastern Asia, however, is totally unlike that of India.

Destructive typhoons make the South and East China Seas dangerous to navigate in summer and autumn.

It will be convenient to consider the economic geography of this region under its main political divisions—the Chinese Dominions (with special reference to China Proper and Manchuria) and the Empire of Japan.

THE CHINESE DOMINIONS.

China Proper.—Three great rivers cross China from west to east—the Si-kiang, in the south, flowing under the Tropic of Cancer; the Yangtse-kiang, in the centre, with a course which nearly coincides with the parallel of 30° N.; and the Hwang-ho, in the north, which flows in every direction except west between 35° and 40° N. The Yangtse rises in Tibet, and with its tributaries drains the centre of China, forming the most important route to the interior, as it is navigable for many hundreds of miles from its mouth. South of the Yangtse the country consists of mountain-ranges running from south-west to north-east, between which great tributaries of the Yangtse flow northward, the Yuen and

the Siang entering the Tungting Lake, and the Kan entering the Poyang. In the summer months, when the main river is in flood, these lakes act as regulators by receiving a portion of the surplus waters, and thus preventing them from inundating the lower parts of the Yangtse basin, which is relatively flat from a little above the Tungting Lake to the mouth of the estuary. The Han is an important tributary from the north-west.

The Hwango-ho also rises in Tibet. Unfortunately it has no regulating lakes to act as reservoirs, and consequently the river, which flows over 400 miles across the plains before reaching the sea, often floods vast areas, doing havoc both to life and property. It has earned the double name of 'China's blessing' and 'China's sorrow,' for it is invaluable as a means of irrigating and rendering fertile the northern plains, while its frequent changes of course not merely cause disastrous floods at the time, but also ruin the farms round its deserted course by depriving them of irrigation. The Hwang-ho is shallow and rapid; it flows through deep gorges, and, unlike the Yangtse, is of little use for navigation. The valley of its tributary the Wei-ho, which rises in Tibet and flows due east, is, however, an important route to the west.

Economically, China Proper falls into three divisions: (1) the Si-kiang basin; (2) the Yangtse basin; (3) the northern plains, including the basin of the Hwang-ho, or Yellow River.

The Si-kiang Basin.—The basin of the Si-kiang, or West River, lies south of the Nanling Mountains, and corresponds in latitude with the Fitzroy River

in Queensland or the Limpopo in South Africa. Tropical vegetation flourishes, but in diminished size, including bananas and other palms, the coconut, and many valuable timber-trees in the mountain forests. In the valleys rice and sugar are cultivated. Silk is produced in large quantities. Tea is cultivated in the north, and tobacco in the west.

The **Yangtse Basin** corresponds in latitude with the south of Queensland and the north of New South Wales. The climate, however, is more extreme, with very cold, invigorating winters and hot, moist summers, becoming cooler in the west, where the land rises towards the lofty plateau of Tibet. Tea and silk are the most important products of the mountains between the West River and the Yangtse. Rice and sugar are cultivated in the valleys of the Yangtse between the Poyang Lake and the east coast. Camphor, wax, and lac are among the products of the forests.

The **Northern Plains** have a still more extreme climate. In the north of the eastern plains the rivers are frozen in winter, though they correspond in latitude to south Italy, or to south Victoria and north Tasmania. A loose, fertile, yellow soil called loess, blown from the desert, covers much of the plains, and even the hollows of the mountains, which can consequently be cultivated to a very great height. Temperate cereals and grains of all kinds are grown; while the hot, moist summers permit tropical and subtropical produce, such as sugar, indigo, rice, cotton, tobacco, and opium,* to be

* As a result of the Anglo-Chinese Agreement of 1911 the cultivation of the opium poppy, which might be grown in all parts of China, was officially prohibited after 1917, and the import of Indian opium officially ceased.

raised on the same fields, at least south of the Gulf of Chihli (Pe-chi-li).

Minerals.—Coal and iron, the most important minerals in modern industry, are very plentiful and widely distributed. Coal is abundant in the mountains immediately west of the great plains north of the Hwang-ho, where the best anthracite and bituminous coal occur in great seams, which in the province of Shansi can be quarried. The whole of south-eastern Hunan—that is, the valley of the Siang—may not unfitly be called one great coalfield. Besides these two vast coalfields, in united area greater than the whole of Ireland, coal is found in many of the western mountains, especially in Sechwan. It also occurs in the higher land both north and south of the Gulf of Chihli. The chief sources of supply at present are the Kaiping mines, near Tientsin, which furnished over 20 per cent. of the total output of nearly twenty million tons in 1921; the Fushun mines in Manchuria; the Pinghsiang mines in Kiangsi; and others in Honan, Shantung, and Chihli. Iron is abundant in the Shansi and the western coalfields, and in Manchuria. The leading province at present is Hupeh, in the Yangtse valley. Tin is the most important mineral export, the most valuable deposits being found near Mengtse, in Yunnan. Copper occurs in Yunnan, Sechwan, and near Kiu-Kiang, on the Yangtse-kiang. Antimony is obtained near Changsa, in Hunan. China is the largest producer of antimony in the world. Silver, zinc, and lead are also found and exported.

Manufactures.—China has long been famous for exceedingly fine porcelain, bronze, and textiles. Domestic manufactures of many kinds are carried on;

factories of European type have rapidly increased in number, mainly in the provinces of Chihli, Kiangsu, Hupeh, Kwangtung, Shantung, and Manchuria, to manufacture textiles, iron goods, and munitions of war. Sugar-, flour-, oil-, and paper-mills, and tobacco-factories have also been established on a large scale. China may yet take rank among the chief manufacturing countries; and with its coal, iron, and cheap labour, its varied products, and its proximity to the sources of many raw materials, such as wool, cotton, jute, &c., it may prove a serious rival to Europe and America in spite of its disadvantage of dry winters.

Means of Communication.—Water is the most important means of communication. The Si-kiang is navigable for large vessels as far as Wuchou, beyond which smaller boats continue the navigation almost to the frontier. A canal connects the Si-kiang with the Yangtse-kiang by joining the Kwei, a tributary of the former, to the Siang, a tributary of the latter. A great part of the trade of western and central China passes through the basin of the Yangtse. The main stream is navigable for ocean steamers as far as Ichang, over 900 miles from its mouth. The favourable period for navigation above Ichang is when the river is low in winter; while below this point flood-time, when the shoals are well covered, is best. Above Ichang are great gorges where navigation is impeded. Smaller steamers can, however, ascend as far as Chungking, the most important river-port in Se-chwan, at the mouth of the Kialing. The Kialing and the Min drain this fertile province, comparable with England in its area, population, and the well-being of its people.

The canal system of China is highly developed. Many centuries ago the Grand Canal was constructed across the great plains between Hangchow, on a gulf of the same name, and Peking, the northern capital. This canal unites the lower Yangtse and Hwang Rivers, and although much of it has fallen into bad repair, the section south of the Hwang-ho is still navigable, at least for small boats. The Hwang-ho is of little use for navigation, but the Pei-ho and its tributaries form an important means of communication across the northern portion of the plains, and join Peking to its port of Tientsin.

There are now about 9000 miles of railway in China. From Harbin, on the Trans-Siberian Railway, a line runs south through Mukden, now a growing railway centre, to Port Arthur; one branch crosses the Yalu River to Fusan, in the extreme south-east of Korea; another goes to Taku, from which port a line runs inland through Tientsin and Peking to Kalgan and Suiyuan. From the capital a line has been completed as far as Hankow, on the Yangtse-kiang, and is being continued south to join the line from Canton. A railway from the coast at Tsingtao, on Kiauchow Harbour, through Shantung, joins the Peking-Hankow line at Ching-ting-fu, from which point a line proceeds westward to Tai-yuan, in Shansi. A line has been opened from Nanking to Shanghai, which is connected also with Ningpo. The Tientsin-Pukow railway, which crosses the Yellow River, forms an important north to south route through a fertile country with a very dense population. In southern China a railway runs up the valley of the Red River from Haiphong, on the coast of Tongking, across the tin and copper fields of

Yunnan to Yunnan-fu. Canton is connected by railway with Kowloon. An important line is projected from Hankow to Sechwan.

Trade.—A considerable trade is carried on overland through Tali-fu with Siam and Burma, through Chengtu on the Min with Tibet, through Lanchow with central Asia, and through Peking with Mongolia and southern Siberia.

About fifty ports are open to foreign vessels, the most important being Shanghai, the outlet for such of the produce of the Yangtse valley as is not shipped direct from Ichang, Hankow, Chinkiang, or other river-ports; Canton, Dairen, and Tientsin.

The silk and teas of the fertile south-eastern provinces are sent to several ports, such as Fuchow, Amoy, and Swatow. The produce of the Si-kiang basin is brought to Canton, on its delta, off which rises the British island of Hong-kong, where a very large entrepôt trade is carried on. Kiauchow and Chifu are the chief ports of Shantung. Tientsin is the outlet for the northern part of the plains.

China is mainly self-supplied, but is every year obtaining more of its manufactured goods from abroad. The chief imports are cotton goods, oils, rice, sugar, hardware, and petroleum. To foreign markets China exports silk, tea, raw cotton, eggs, soya beans, oil cake and seeds, straw, hides and furs, and paper. China is so vast a country, with such diverse climatic and economic conditions, that it may well remain self-supporting. It possesses an abundant supply of labour, and its traders are well known for their mercantile ability and commercial probity. As the means of communication are extended, the mineral

resources developed, and modern methods introduced into the industries of the country, the Republic may become a serious economic rival to the leading nations of the world.

Manchuria is a great undulating lowland, lying between the Khingan Mountains and the mountains which form the northern border of Korea. It is drained in the north by the Sungari and its tributaries, and in the south by the Liau. The extremes of temperature are very great. The winter is cold, and the soil is frozen for four months. At the end of March ploughing begins. Wheat and barley are sown, and are harvested before midsummer, and a crop of millet or beans is planted in time for the summer rains.

'Millet is the chief food of the people, but much wheat is grown in the north; barley is cultivated for distilling; maize, root-crops, vegetables, opium, tobacco, and many fruits are raised. Beans are used not merely for food but for the oil, expressed under great granite wheels. The mountains, especially in the south and east, are covered with forests, which consist of deciduous trees at low levels, and of conifers at greater altitudes. Many trees are felled, and the logs are floated down the rivers, especially the Sungari, to the plain.

'The Chinese of Manchuria are farmers in summer and carters in winter, when transport by cart or sledge is easy over the frozen soil. Conveyance by cart is necessary, as in this hilly land the rivers are rapid, and not very navigable, although both the Sungari and Nonni might be much more used than they are.

'Chinese immigration is constant, and has resulted in the agricultural development of the two southern provinces, while most of the northern ones still remain to be broken by the plough. As a whole the people are prosperous peasants, living on their own property. Want is felt only in times of famine or flood. The taxes are said to be the lightest in the world.*

Harbin is a growing railway and industrial centre, containing large flour-mills, distilleries and breweries, soap and candle factories, oil-mills, and glass-works. Dairen is the centre of the soya-bean industry. Extensive deposits of coal and iron are found in the country, and ironworks are in operation near Liaoyang and at Penchihu, from which the output of pig-iron is shipped mainly to Japan. Niuchwang, on the Liau River, and Dairen, in the Japanese leasehold, are the chief ports through which beans, cereals, maize, oil, Tussah silk, tobacco, and hemp are exported. The leading imports are textiles, hardware, oil, and machinery.

JAPANESE EMPIRE.

The Japanese Empire extends from the south of Formosa, south of the tropic, to the north of the Kurile Islands, 50° N., and includes the southern half of Sakhalin. It is also mandatory to the Marianne (Ladrone), Caroline, and Marshall Islands in the Pacific.

Formosa.—Formosa is mountainous, and receives heavy rains from the trade-winds on its eastern slopes, which are densely forested with camphor and other useful trees. On the western plains rice, sugar, and tea are cultivated.

The chain of the Luchu (Riukiu) Islands, which

* Article in *School World*, Jan. 1901, p. 21, by A. J. Herbertson.

produce sugar and rice, connect Formosa with Japan Proper.

The Japanese Islands consist of four large and many small islands, lying between 30° and 45° N.—that is, almost in the latitudes of New Zealand. The mountainous northern island of Hokkaido, or Yezo, corresponds in latitude with the South Island of New Zealand, but is smaller and has a colder winter. It is thickly forested. Earthquakes are frequent.

The wealth of Japan is concentrated in the southern islands, Honshiu (Hondo), Shikoku, and Kiushiu. All are very mountainous, with loose volcanic soil, which is easily carried away by the rivers when in flood. The climate is extreme, especially in the north of Honshiu. Most rain falls in summer, except on the western slopes, where snow falls heavily in winter, borne by the north-west winds across the Sea of Japan. The north of Japan is covered with woods, in which camphor, lacquer, wax, paper, and mulberry are the most important trees. Two-fifths of the land is under cultivation, more than half the cultivated area producing rice. Barley, millet, pulses, and other foods are grown, and in central Japan are great tea-plantations.

Agriculture has always been the first Japanese industry. Small holdings are the rule, and the care bestowed on the land causes Japanese farming to resemble horticulture. Skilful rotation of crops, sub-soil working, constant manuring, and unsparing labour, assisted by copious rains and much sun, secure favourable results from a soil not naturally fertile. Night-soil is, as in China, intensively employed. In specially favoured localities irrigated rice-fields bear two crops.

In many districts, when the wheat is harvested in May, the land is prepared for rice-plants from the 'nurseries' where the seed is sown. Local cotton is of very short staple, and imported fibre is preferred. The area under mulberry and tea has been greatly increased. The fisheries of Japan are an important source of wealth, the chief fish caught being tunny, bream, mackerel, shark, and cuttle-fish.*

Minerals.—Copper (the most productive localities being Akita, Tochigi, and Ehime), gold (found in Kagoshima, Hyogo, and Niigata), iron (the chief deposits of which are at Kamaishi), silver, antimony (in Shikoku), petroleum, and lead (found in Tsushima island) are the chief metals. Coal, however, is the most valuable mineral, its production having increased from three and three-quarter million tons in 1891 to nearly thirty million tons in 1920. The most extensive coalfields are in Kiushiu, the mines at Chikuzen and Buzen, in the north of the island, furnishing more than half the total output from Japan. The Miike mines, on the eastern shore of Shimbara Gulf, and the Takashima coalfields, near Nagasaki, are also of increasing importance. In connection with the former a coaling-station has been established at the mouth of the Suwa River. In Hokkaido the largest deposits are found near Poronai. Sulphur, which is principally obtained in Hokkaido, is now a considerable item in the export trade of the country, the production of refined sulphur having reached 40,900 metric tons in 1920. The output of petroleum, chiefly from Echigo, has risen from nine million gallons in 1897 to seventy-seven million gallons in 1920.

* Summarised from *Chambers's Encyclopaedia*, new edition, vol. vi.

Manufactures.—Japan has long been famous for its manufactures, among which are exquisite tissues, porcelain (especially near Nagoya), bronzes, hardware, and wooden and lacquer ware (at Kyoto and Tokyo). Japan opened its doors to foreign influence a generation earlier than China. Its industrial establishments have doubled in number since 1908, an important factor in this development being the abundant supply of cheap labour, especially of female and child labour. The cotton industry has undergone remarkable developments, and the output from Japanese mills increased in value ten times between 1910 and 1920. Most of the manufactured cotton is exported to China and India. The manufacture of silk (mainly in the prefectures of Nagano and Gumiwa) and of wool, sugar-refining (which has now become a staple industry), paper-making (chiefly carried on near the sources of supply in the provinces of Suruga and Totomi, and more recently in the Sapporo district of Hokkaido), the chemical industry, the manufacture of matches (which have almost displaced Swedish matches in the markets of eastern Asia), of soap (at Amagasaki), of steel and machinery (at Wakamatsu, Kure, Ozaka, and Muroran), of dyestuffs, and of ships (at Nagasaki) are all being steadily developed along the most up-to-date lines.

Trade.—Japan has a large foreign trade. Silk and silk manufactures are the most valuable items of export, forming 40 per cent. of the outgoing trade. The largest proportion of the raw material goes to the United States, which also takes about 90 per cent. of the tea exported from Japan. Cotton yarn and manufactures, copper, coal, and matches are also among the

leading exports. By far the most important import is raw cotton, followed by iron goods and machinery, soya beans and oilcake, woollen goods, rice and other foodstuffs. The largest trade is carried on with the United States, China, and British India. The principal exports to Great Britain from Japan are silk tissues (*habutae*), silk handkerchiefs, raw silk, wheat, soya beans, straw plaiting, copper, electrical goods, and paper. The value of those exports has more than doubled between 1912 and 1922. The export of wheat and soya beans (for oil extraction) is of very recent origin.

Means of Communication.—Few parts of Japan are more than sixty miles distant from the sea, and the coasting trade is very important. A railway runs from Kagoshima, in the south of Kiushiu, with branches to Nagasaki and Sasebo, through a coal-mining region to the coaling port of Moji, opposite the port of Shimonoeki, on Honshiu; from this point a railway runs along the south and east coasts to Aomori, in the extreme north of Honshiu, and connects the important ports of Kobe, Ozaka, and Yokohama, and the ancient and modern capitals, Kyoto and Tokyo. In Hokkaido the chief ports are Hakodate, an important fishing-station, Otaru, and Muroran. From Hakodate a railway runs through Sapporo and the Poronai coal-field throughout the island. The railway mileage has increased from 73 in 1880 to 6728 in 1922.

Korea.—Korea (Chosen) was annexed to the empire of Japan in 1910. It is a mountainous peninsula, with a steep slope to the east, and a gentler slope westward to the Yellow Sea, in which lie innumerable islands. The eastern slopes, which receive much more

rain than the western, are covered with dense forests. There are fine pasture-lands in the west. The southern plains grow rice, wheat, beans, tobacco, and cotton; while those of the north produce cereals and root-crops of temperate lands, such as barley, oats, and potatoes. Ginseng, which is grown in the neighbourhood of Kai-song, is one of the most valuable products of Korea, and is in great demand for export to China, which also takes rice and beans. Gold is found and mined, chiefly at Gensan. Coal, including anthracite, iron, copper, graphite, and mica are abundant, but their development is retarded by poor communications. Extensive salt-fields, for manufacture by spontaneous evaporation, have been established at Koang-Yong Bay. Textiles, timber, coal, oil, sugar, and machinery are the principal imports; while rice, beans, hides, and cattle are the leading exports. About 80 per cent. of the total trade is with Japan. The chief ports are Chemulpo in the west, Fusán in the south, opposite Japan, Gensan in Broughton Bay in the east. The country, however, is still little opened up, but the means of communication are being steadily improved, and its great resources developed. A railway runs throughout the length of the country from Wiju, at the mouth of the Yalu River, in the north-west, through Seoul, to Fusán, in the extreme south-east. From Seoul a line runs north-east to Gensan, while a branch leaves the main line at Tai-fun and runs along the south-west coast to Mok-po. There are about 5000 miles of government highways.

CHAPTER XVI.

RUSSIA AND THE BALTIC LANDS.

(In this section general names have been used and political divisions for the most part ignored.)

THE Union of Socialist Soviet Republics, forming the greater portion of the former Russian Empire, over 8,000,000 square miles in area, stretches from 35° N. to beyond the polar circle, and from the Baltic to the Pacific. It lies farther north than any of the lands yet considered, with the exception of Canada. The Crimea and Transcaucasia correspond approximately with the Lake peninsula of Canada, the great plains of Siberia with those of Central Canada, and the Amur highlands with those of British Columbia. The Transcaspian, or Turkestan, republics have no analogue in Canada.

Asiatic Russia.

Amuria and Siberia.—Amuria consists of the forested Trans-Baikal plateau and the eastern mountain region drained to the Pacific. Its climate is one of great extremes. The rainfall is heavy near the coast, but small in the interior.

Siberia extends west to the Urals as a vast lowland, drained to the Arctic Ocean. It is crossed by the great rivers Lena, Yenisei, Ob, and their tributaries. All are navigable for many hundreds of miles in summer, but are ice-bound in winter. The two last-named have vast estuaries opening into the Arctic Ocean, which can be reached by vessels from Europe in favourable summers, and which might perhaps be kept open every summer by means of

ice-breakers. The climate of Siberia is drier and even more extreme than that of Amuria. In the north the surface consists of tundra, where the soil produces only dwarf vegetation, in which lichens predominate. This zone is succeeded to the south by a forest zone, giving place in its turn to grassy steppes gradually passing into desert.

Both Amuria and the mountains of southern Siberia are rich in minerals. Gold is obtained in large quantities in eastern Siberia by gravel-washing, and in the west by quartz-mining. The most productive gold-bearing regions are the Olekma and Vitim valleys in the Lena basin (perhaps the richest gold-producing region in the world), the Amur district, and the eastern mountains of Amuria. Iron ores occur in the vicinity of Irkutsk, the Selenginsk region, and in the Altai; while the chief ironworks of the Ural district are on the eastern side of the mountains. The construction of the railway created a demand for fuel, and has led to the development of the coal resources of Asiatic Russia. In western Siberia the coal basin around Cheremkhovo, 70 miles NW. of Irkutsk, is at present the most productive; but extensive deposits of coking coal are known to exist near Kuznetsk, in the Ob basin, at the base of the rich mineral region of the Altai, and at Ekibas-tuse in the Kirghiz steppe; but the transport facilities must be improved before any great development of these fields becomes possible. In eastern Siberia the principal coal-producing regions in the Amur and Lena valleys, and in Transbaikalia, yield chiefly lignitic coal. At various points in the Maritime Province and in Sakhalin anthracite coal exists, but

is little worked. Silver, lead, zinc, tin, and copper occur in the Altai and Nerchensk Mountains. Copper is being worked in the Karkaralinsk district of the Kirghiz Steppes, where local coal is used for smelting the ore. The Siberian slopes of the Urals are among the chief platinum-producing regions of the world.

The economic development of Siberia is only beginning. Half a century ago it was little more than a penal settlement, but the opening of the Great Siberian line led to a great influx of Russian immigrants. The steppes are now being covered with immense crops of wheat, just as the corresponding plains of Canada were covered after the opening of the Canadian Pacific line. The similarity of Siberian and Canadian agricultural conditions accounts for the increasing imports to Russia of American agricultural machinery. The rearing of live stock and the dairy-ing industry have made even more progress than agriculture.

The fisheries are a factor of some importance in the development of Asiatic Russia. The fishing industry is being developed on the Ob and the Yenisei, and on Lake Baikal, but the principal centre lies in eastern Siberia. On the Amur and the coastal waters and rivers of Kamchatka there are extensive salmon-fisheries; much of the produce is either dry-salted for the Japanese market, or frozen or canned for the Russian, English, or colonial markets. Large quantities of herring, cod, and sturgeon are also obtained in the waters and rivers of the Far East. The herring catch is mainly utilised for the manufacture of *tuk*, or fish-manure, which is in great demand for the rice plantations of Japan.

The Great Siberian line is the longest direct line in the world. Its present Pacific termini are Port Arthur and the commercial port of Dairen, both on the Liautung peninsula, and Vladivostok, on the 'Golden Horn of the East,' from which point the journey to Moscow, a distance of 5500 miles, is accomplished in nine days. In addition to the line through Manchuria (see page 178), another runs from Vladivostok to Khabarovsk, on the Amur, whence passengers and freight are carried up the river valley past Blagovyestchensk, the chief and rapidly developing commercial centre, and Stretensk, both connected by branches to the main line, to join the original main line from Manchuria, near Chita. The line, still running west, curves round the south of Lake Baikal to Irkutsk, the most important town of central Siberia; and nearly coinciding with the parallel of 45° , passes through the growing towns of Krasnoyarsk on the Yenisei, to Omsk on the Irtish. Two lines leave Omsk, one running north-west to Tyumen and Ekaterinburg, the other to Chelyabinsk in the southern Urals, where it divides, one branch passing west through Samara to Moscow and Leningrad (Petrograd), the other north through Perm to Vyatka for Leningrad and for Kotlas on the Northern Dvina, which in summer is navigable to Archangel, now connected by rail with the Leningrad line at Vologda. Branches have been laid through the Baraba Steppe, up the Ob valley by Barnaul to Semipalatinsk, along the Tom River to Kuznetsk and to Minusinsk in the upper Yenisei valley. A line from Ekaterinburg* for Tobolsk is more than half completed. From Vladivostok a line runs to the Suchan coalfield. Among several important exten-

* Now Sverdlovsk.

sions proposed is a south Siberian State line, joining Uralsk and Pavlodar, and crossing the Kirghiz Steppes and the Altai to the Great Siberian Railway. It has also been proposed to construct a water route to unite the waterways of Asiatic Russia with the Volga, and thus reduce the cost of transport of Siberian produce.

In western Siberia the area under crops in 1913 was about 17,000 square miles; in eastern Siberia 2800 square miles. The total cereal crop was 68,200 cwt. Western Siberia is the principal centre in the country for the production of butter, which is practically the only output from the Siberian farms. During the first decade of the century the butter freights on the Siberian Railway increased by 83 per cent., and they now exceed 75,000 tons per annum. Much of the butter is shipped to the London market through the Baltic ports, to which it is conveyed in special refrigerating cars. Furs, tallow, hides, feathers, fish, and game are also considerable exports from Siberia. Of goods in transit, tea is the most important, principally from China. The leading imports by the Siberian Railway are hardware, machinery, agricultural implements, sugar, textiles, and petroleum.

Turkestan.—The Soviet Republics of Central Asia are a desert fertilised by rivers which rise in the melting snows of the surrounding mountains, bordered on the north by the zone of the Steppes. The Syr Daria and its tributaries create the fertile regions of Ferghana and Tashkent; the Zerafshan, the oases of Samarkand and Bokhara; the Amu Daria, the oasis of Khiva; and the Murghab, the oasis of Merv. The winters are long and very cold, but the

summers are so warm that cotton is the most important crop under cultivation, covering, in 1915, nearly 750,000 acres in Ferghana alone. With the extension of irrigation the area under cotton could be very considerably increased; the raw material is sent to the mills of European Russia, where it supplies about 50 per cent. of the total consumption. Rice, maize, and sorghum are summer, and wheat and barley are winter, crops on the oases; gardening is a growing industry south of Syr Daria, and large quantities of vegetables and every kind of Mediterranean fruit are grown. Wines are prepared in Tashkent and Samarkand, and quantities of currants and raisins exported, along with such fresh fruits as apples, pears, quinces, peaches, nectarines, apricots, melons, and grapes, to Russian markets. The silkworm is reared, especially in Bokhara and Ferghana. On the steppe-lands are many flocks and herds, which yield hides and wool. The minerals, including coal and oil in Ferghana, are numerous, but are as yet scarcely utilised. The fisheries of the Aral basin have undergone a remarkable development with the extension of transport facilities. The most valuable are found in the Syr Daria region. The fishing is almost entirely carried on during the winter, and the catch is delivered in a frozen condition, the principal kinds being silurus, bream, carp, and pike. A railway connects Tashkent, Andijan, and Kokan, by Samarkand and Bokhara, with Krasnovodsk on the Caspian, tapping the trade of north-east Persia at Askhabad. A line from Tashkent crosses the Steppes to Orenburg, where it joins the Russian railway system.

Transcaucasia. — Transcaucasia lies south of the

Caucasus, and includes the federated republics of Azerbaijan, Armenia, and Georgia. Its climate is less severe than that of Central Asia, the Caucasus acting as a barrier to the cold north winds. The rainfall is very low east of Tiflis, the chief town of the Federation, but is heavy in the western Caucasus. The mountains are forested. Cultivation is carried on in the valleys. Tea has been planted on the slopes of the Caucasus, but the scarcity of labour militates against its success. Every kind of Mediterranean fruit, including the vine, can be cultivated. Cotton cultivation is extending, more particularly in the south.

Russia occupied (1922) the third place among the petroleum-producing countries of the world, and furnished about 4 per cent. of the total output. The richest petroleum region is situated on the Apsheron Peninsula (Azerbaijan), on the western side of the Caspian Sea, Baku being the seat of the industry. From the wells at Baku nearly ten million tons of oil were obtained in 1927, and the output is likely to be maintained. The oil is either sent across the Caspian by steamers, which make use of it as a fuel, to Astrakhan, the principal distributing centre of Russian oil shipments, or it is conveyed by huge pipe-lines, a distance of five hundred miles, to the Georgian Black Sea ports at Batum and Poti. Large petroleum deposits are also found in the Grozny district, on the Russian side of the Caucasus; the output is carried by rail to Petrovsk, on the Caspian, where it is shipped to Astrakhan. Extensive oilfields are being developed in the Emba valley, in the north-east of the Caspian. Oil is also obtained from the wells on the island of Cheleken, in the Caspian. The Maikop oilfields, situated in the

valley of the Bielaia River, which drains northwards from the Caucasus to the Kuban, were discovered in 1910, and developed a large, steady production about the end of 1915.

European Russia.

Configuration.—European Russia is a vast undulating plain, covering about 1,500,000 square miles. It includes the federated Socialist Soviet Republics of Russia, the Ukraine, and White Russia. Across this plain flow some of the longest rivers of Europe—the Volga to the Caspian, the Don to the Sea of Azov, the Dnieper to the Black Sea, the Western Dvina through Latvia to the Baltic, and the Northern Dvina to the White Sea.

Climate.—There is great diversity of climate, varying from Arctic conditions in the north, where the winter lasts for many months and the rivers are ice-bound, to a Mediterranean climate in the southern Crimea. Russia may be profitably compared with Canada, from Lake Erie to the Mackenzie delta.

Vegetation Zones and Productions.—The tundra of the Arctic coast is succeeded to the south by coniferous forests, which stretch from the Gulf of Finland to the south of the Urals. South of the conifers come forests of mixed woods, extending from the north of the Carpathians to the confluence of the Kama and the Volga. Still farther south are grassy steppes, passing into desert salt steppes towards the Caspian Sea. The southern boundary of the forests agrees with that of morainic soils, while the steppe-lands are covered with loess, which, when mixed with humus, forms a rich black earth.

One-fifth of the surface of European Russia is unproductive; nearly two-fifths are forested; the remaining two-fifths consist of meadow and arable land. More than one-fourth of the whole surface is under cultivation.

Until the outbreak of the Great War in 1914 there was a remarkable development of Russian agriculture (upon which three-fourths of the inhabitants are directly dependent), due principally to the adoption of improved methods of cultivation and the application of modern machinery, as well as the exploitation of the fertile lands of Siberia. In the economic chaos following the War famine was rampant, for grain production was very seriously reduced. The extreme north and the extreme south-east of European Russia are pastoral. The reindeer is kept on the tundra; sheep, cattle, horses, pigs, and goats on the steppes. Dairy-farming is a very important industry in the northern provinces. In the clearings of the coniferous forests the principal cereal is oats, with the addition of wheat in the Kama basin. Hemp is grown in the centre of this zone. Flax is extensively cultivated in the central and northern provinces, Russian flax occupying a similar position on the markets of the world to that held by American cotton. In the Ukraine, near the Carpathians, and between the Oka and the Dnieper, large crops of sugar-beet are raised. In the south, especially in the provinces of Voronezh and Tambov, there is a large poultry-rearing industry. Except in the south-east, the steppes are composed of fertile black earth (*chernoziom*), and form the great wheat-growing region of European Russia. Flax is also cultivated in the *chernoziom*,

as well as along the lower Don. The vine flourishes in the Crimea and along the Kuban. The cultivation of fruit, especially plums, apples, pears, cherries, apricots, and even peaches, is an important industry in the Crimean valleys and the Volga region. Rye is grown everywhere for food, except in the salt steppes of the south-east, where the rainfall is too scanty.

The extensive system of rivers, lakes, and inland seas in Russia furnishes valuable quantities of fish of various kinds. The fisheries of the Caspian basin are the most important ; sturgeon is obtained in the Kura River (Azerbaijan) and in the Volga delta, but the herring-fishing is the most valuable ; in addition to supplying the local markets, especially of southern Russia, where herrings form the staple animal food of the people during the summer months, large quantities are exported, either in a fresh condition, or after being salted and canned. Astrakhan is an important refrigerating centre. Roach, perch, pike, and dace are obtained in the lakes of north-west Russia, while valuable salmon-fisheries are found in the rivers entering the White Sea, and cod, haddock, and flat-fish along the Murman coast.

Russia is well supplied with minerals. The Urals are exceedingly rich in both precious and useful metals, including platinum (of which the empire supplies the greater part of the world's total production), gold, silver, copper, iron, and coal. The most important coalfields are those of the Urals, the Oka (of which Tula is the centre), and the Donets basin. On all these iron is plentiful. Salt is obtained from the salt lakes and seas, and in the centre and north from rock-salt.

In manufactures, the domestic industries are still the most important, almost every article, from the coarsest to the finest, being produced, generally under some system of co-operation. In recent years, however, there has been a great extension of the factory system, more particularly in the Moscow district (where female labour plays an important part), in south Russia, and at Leningrad. Many of these factories were financed by foreign capital. In addition to the cotton industry, which is generally carried on with British machinery and frequently under the supervision of Lancashire men, wool and hemp are the chief textiles manufactured. The cotton industry is the most highly developed, and had made great progress by 1914. The principal manufacturing centres are in the provinces of Moscow and Vladimir. Russian cottons find a market in Persia and the Far East. The chief centres of the Russian woollen industry are in the Moscow district, where thin fabrics are produced; and in the provinces of Tambov and Simbirsk,* where Russian wool is made into heavy, coarse cloths. Iron, engineering, and electrical works are increasing in number, especially in the southern provinces, where local coal and iron are used; foreign contracts are being obtained, particularly in the Donets basin, for iron and steel goods (made with coal supplied principally from the Ekaterinoslav† and Kharkoff districts). As a result of agricultural development throughout the republic, the manufacture of agricultural machinery and implements is growing rapidly. Spirits, sugar, soap, candles, paper, earthenware, tobacco, and many other manufactures are increasing rapidly. Owing to the disorganisation following the

*Now Ulianov.

†Now Dnepropetrovsk.

Revolution of 1917, industrial progress has received a great set-back, and is recovering very slowly.

Trade, Towns, and Routes.—As a result of war losses, territorial changes, and economic ruin, the population of European Russia is probably less than 135,000,000.

In the matter of internal communication, Russia is magnificently supplied with lakes and navigable rivers, the only drawback being that they are frozen during the winter months. The Volga, the longest and most important river of European Russia, is connected by canal with the great lakes in the north-west; along its lower course the river is navigable for barges up to 8000 tons. The traffic normally carried by the Volga and its tributaries amounts to sixteen million tons per annum.

Leningrad (Petrograd), on the canalised Neva, is an important manufacturing and commercial centre, though its trade has greatly declined. Moscow, in the heart of the country, the physical, ecclesiastical, political, and commercial capital of the republic, stands at the head of navigation on the Moskva, which flows into the Oka, a tributary of the Volga. From Moscow railways radiate in all directions, connecting it with Vienna, Berlin, and Leningrad, and the ports of Archangel on the White Sea, Port Arthur and Dairen on the Pacific, Petrovsk and Baku on the Caspian, and the various Black Sea and Baltic ports. The main line to the south passes through the manufacturing and mining region round Tula to Kieff, the capital of the Ukraine, and to Kharkoff, the centre of the Donets industrial region. This and the other southern lines carry wheat for export from the ports of Odessa, Nicolaieff, Kherson, and Taganrog. Great fairs are

held annually in many towns, that of Nizhni-Novgorod being the most important.

The export trade of European Russia is in cereals—wheat, barley, rye, oats, and maize—shipped chiefly from the Black Sea ports; timber and pulp wood from Leningrad, Kronstadt, Archangel, and through Riga, Windau, and Libau in Latvia; flax, linseed, eggs, and dairy produce, principally from the Baltic ports. The imports are raw materials, wholly or partially manufactured goods (including hardware, machinery, and textiles), tea from China and from Ceylon, fish, spirits, coffee, and other colonial produce. The largest trade is with Germany, and next with the United Kingdom, which takes cereals, timber, tow, flax, linseed, and eggs, and sends in return machinery and iron goods, coal, wool, cotton, woollens, and fish.

Finland.—The republic of Finland achieved its independence of Russia in 1919. The surface is largely covered with glacial lakes, and only 10 per cent. of the area is cultivated with oats, rye, barley, and potatoes. Dairy-farming is important, and much butter is exported. In addition to extensive forest wealth, Finland possesses vast water-powers which are partly harnessed for industrial purposes at Tammerfors (Tampere) and elsewhere. Helsingfors (Helsinki) is the capital and chief port. The principal exports are timber, wood pulp, and paper.

The Baltic Republics—Estonia, Latvia, and Lithuania—also became independent after the war. Agricultural products are the same as in Finland. All export flax and timber. Many Russian commodities pass through Latvian ports, and the re-establishment of Russian foreign trade will be reflected in increased

traffic through the Baltic ports. In Estonia, Reval (Talinn) is the capital and port; in Latvia, Riga; in Lithuania, Kovno (Kaunas) is meanwhile the capital, Memel the port. Railways traverse the republics; in Latvia the Düna (Dvina) is navigable into Russia.

CHAPTER XVII.

MEDITERRANEAN LANDS.

THERE is a similarity of the climate and productions of the lands bordering the Mediterranean Sea which makes them one great natural region. The southern boundary is formed by the arid Sahara, a far more formidable barrier than the mountainous regions of the Pyrenees, the Central Plateau of France, the Alps, the Balkans, and the Caucasus, whose southern slopes are its northern limit. The waters are deep, the coasts are broken, and the inland regions are mountainous, so that the configuration favours communication by sea, which has always played an important part in the history of the Mediterranean region. The eastern limit of the region is naturally the Syrian and Arabian deserts in the south, but as the climate and productions of Persia are very similar, the eastern boundary may be extended in the north to the Persian deserts.

The peninsula of Italy divides the sea into two basins, the Eastern and Western Mediterranean. The Eastern Mediterranean consists of the sea extending from the Levant to the Gulf of Gabes. Two great extensions open to the north—the island-studded Ægean

leading to the Black Sea, and the Ionian Sea leading to the Adriatic. Except for the irrigated Nile valley, the southern lands are almost desert. A number of narrow and short valleys are found round the coasts of Asia Minor and the south of the Balkan Peninsula, and small fertile basins exist at higher levels. Much of the land of these two peninsulas is rugged mountain-land. The only extensive alluvial plain opening into the Eastern Mediterranean basin is that of the Po, at the head of the Adriatic, which, except here and in Apulia, is bordered by mountains. The Western Mediterranean is bordered by the foreland of the Atlas Mountains, the valleys of Spain at the foot of the plateau (*meseta*), the coastal lands of southern France and the lower Rhone valley, the Riviera, the western slopes of the Apennines and the hilly lands that skirt them, and contains the islands of the Balearic group and Corsica, Sardinia, and Sicily. The Majerda, lower Rhone, and Ebro are fertile alluvial valleys opening to the Western Mediterranean. The plains of Andalusia and the lower Tagus may be considered with this region, although they are connected with the Atlantic.

The Dardanelles and Bosphorus, the Vardar-Morava valleys, the Alpine passes (especially the Brenner), the Rhone valley, the Carcassonne Gap between the Central Plateau of France and the Pyrenees, and the Strait of Gibraltar have been the chief passages from this region to the rest of Europe. The connection with Asia has been between the Levant and the Euphrates by the Nile and the Red Sea, or by more difficult caravan routes across the Syrian tableland or Armenian plateau.

Climate and Productions.—The climate of Mediterranean lands resembles that which we have studied in Victoria, south-western Australia, and the Cape peninsula of South Africa. The summers are hot, but dry. Most rain falls in winter, or else in autumn or spring.

The dry summer is the resting-time for plants. It permits the ripening of fruits of all kinds, and allows them to be preserved by being dried in the sun.

The Mediterranean region, therefore, is a fruit-producing region, where the softer fruits can come to perfection.

The vine is the most important, and is grown for its fruits—(a) fresh grapes; (b) dried raisins or currants, especially in the eastern regions inhabited by Mohammedans, who are prohibited by their law from drinking wine; and (c) grape juice, which is fermented into wine in the western region.

Oranges and lemons, figs and olives, peaches and apricots, carobs (locust beans), pomegranates, and, in the oases of the African desert, dates are among the other fruits of this region.

The oak-tree is very important, one species yielding cork; another, indigenous to the Levant, acorn-cups, known as valonia, which is used by tanners. Barley is the most important cereal in this region; rice and cotton are grown in the irrigated lands of the Po and other rivers. The Wallachian plain, which produces much wheat and maize, is rather to be considered with Russia than with Mediterranean countries. The Nile forms a strip of fertile land through the desert, where cereals, cotton, and pulses are cultivated. Throughout

the Mediterranean region, lucerne, a kind of clover, is a most important crop.

In the mountain regions sheep and goats are kept, the flocks being driven up to the hills in summer and down to the plains in winter. Mules and donkeys are more common than horses. Dairy produce is of little importance, except in northern Italy, where cheese is made. Oxen are used for draught purposes. Fowls are very numerous.

The minerals are not important except in the Balkan and Iberian Peninsulas, where the older rocks are rich in many metals, especially copper and iron.

Domestic industries are the most important over much of this area. Modern manufacturing processes are adopted in the larger cities, especially in the west. The valleys of the Po and Rhone are busy industrial regions.

The trade of the different countries has been described in Chapter IX. of the first part of the author's book in this series on the *Commercial Geography of the British Isles*, pp. 114-118.

PERSIA.

Persia is a desert plateau, with a more fertile western and north-western margin, especially where irrigated, and dense forests on the northern slopes of the Elburz Mountains south of the Caspian. It may be described with the Mediterranean region, as most rain falls in winter, and the natural products are of Mediterranean type. Fruits, rice, wheat, cotton, wool, silk, and opium are the chief vegetable products, and carpets and hides the principal manufactured articles. The country appears to possess valuable

mineral resources, including copper, lead, tin, iron, and coal, but the lack of transport facilities prevents their development. At Nishapur, west of Meshed, turquoises are mined. In the bend of the Karun River petroleum is obtained, and a pipe-line conveys the oil to the refinery at Abadan. The trade in the north has been mainly in Russian hands, from Meshed in the north-west to Askhabad on the Trans-Caspian Railway, and from Tehran or Teheran, the capital, to Resht on the Caspian. The bulk of the trade from the north-west, where Tabriz is the chief centre, passes through the Black Sea ports of Trebizond and Batum. Direct overland trade with India has been opened from Kerman and Seistan by the railway route from Duzdab through Baluchistan, and also through Afghanistan; but most still passes through Isfahan and Shiraz and the Persian Gulf ports, of which Bushire, Bandar Abbas, and Mohammera are the most important. Within recent years several roads have been built, but transport, mainly carried on by camels and mules, is both slow and costly, and often beset with danger. Proposals have been made to construct a railway across Persia to form part of an Indo-European system. A line from Julfa, on the Russian frontier, runs to Tabriz, and short lines run from Teheran and Resht. The Karun River is open to foreign navigation as far as Ahwaz.

EGYPT.

Egypt is a desert except on either side of the Nile where the waters cover the land in times of flood, or where it is irrigated by pumping the water from the river. The flood-waters deposit a fertile mud, which

comes from the volcanic plateau of Abyssinia. By means of great dams at Aswan, Asyut, and at the head of the delta, the waters of the river are regulated, and irrigation is assured at all seasons, permitting as many as three crops to be raised in a year. Rice, maize, sugar, wheat, cotton, lentils and other pulses are grown. The cultivation of early vegetables for the European, as well as for the local, markets is extending. The chief city is Cairo, at the head of the delta; the chief port is Alexandria, at the west of the delta, through which nine-tenths of the trade passes; raw cotton forms over 80 per cent. of the exports. By railway and steamer the desert is crossed to the south. The narrow isthmus of Suez is traversed by a canal about 90 miles long and 39 feet deep, between Suez on the Red Sea and Port Said on the Mediterranean, through which pass the greater number of steamers between Europe and India, Australia, and the Far East. Egypt became a kingdom in 1922, but Britain maintains the defence of the Suez Canal.

TURKEY.

The former extensive empire ruled from Constantinople was dismembered after the Great War. In Asia only Asia Minor, with fertile coasts and drier and more barren hinterlands, but containing Angora, the seat of Turkish administration, is left; in Europe that part of Thrace bounded on the west by the river Maritza, growing Mediterranean produce, alone remains. Cotton cultivation is extending in Asia Minor, especially in the Adana province, some of the produce being consumed in the mills of Tarsus and Adana.

Turkey possesses valuable stores of minerals,

especially in Asia Minor, though few are yet exploited. Silver-lead is mined in Konia, copper near Diarbekr, emery at Smyrna, coal and lignite at Heraclea on the Black Sea, and iron in Adana.

The position of Constantinople on the crescent-shaped inlet of the Bosporus known as the Golden Horn ensures it a great entrepôt trade. It lies where the mainland route from southern Europe crosses to Asia Minor, and by it all vessels trading between the Black Sea and the Mediterranean or more distant ports must pass. From the city a railway runs through Salonika (Saloniki) to Monastir.

The chief products exported are silk, fruits (figs and raisins), cereals, mohair, opium, valonia, cotton, minerals, tobacco, and eggs, the principal manufactured article being carpets. Sugar, linen, quilting, cotton-yarn, coffee, petroleum, flour, and rice are the most valuable imports.

Syria is an independent state at present under mandate to France. Cereals (wheat and barley) and fruits (oranges, grapes, olives) are the principal products; tobacco, sesame (for oil), cotton, and hemp are cultivated. Damascus is the capital; Beirut the chief port.

Palestine, under mandate to Britain, has similar products to Syria. The chief port is Haifa. **Arabia**, including the independent states of Hejaz and Nejd, Yemen, Oman, &c., is noted for dates, coffee, and gums.

Iraq, now recognised as an independent state, will develop rapidly under strong government, improved cultivation, and irrigation. Wheat, barley, rice, and ground-nuts are grown; cotton cultivation is extending; and there are great stretches of date-palm groves.

From Haleb (Aleppo) a railway runs southwards to

Medina in the Hejaz, with branches to the Levant coast at Tripoli, Beirut, and Haifa. A coastal line from Haifa runs to the Suez Canal. Jaffa is connected by a line with Jerusalem. From Scutari, opposite Constantinople, a railway has been built to Eskishehr, where it branches eastwards to Angora and Yozgad, and southwards to join the Anatolian railway which runs from Smyrna, the principal port of Asia Minor, through Afium Karahissar, Konia, and over the Taurus mountains to Adana. From Adana the Baghdad Railway runs to Nisibin. Lines are laid up and down stream from Baghdad.

GREECE.

Greece is a barren, mountainous land with a number of small fertile plains. Cereals are the chief crops, but the principal exports are currants and minerals, especially the fine manganese iron ore and hematite from the Laurium region. By draining Lake Copais in Bœotia, over 53,000 acres have been added to the area under cultivation, and on the reclaimed land cotton can be grown. Wines, tobacco, valonia, olive-oil, and figs are minor exports. Cereals, textiles, timber, coal, and food products are imported.

Piræus, the port of Athens, contains shipbuilding yards, textile-mills, and oil-factories. Salonika serves the Macedonian region and Jugoslavia. From Piræus, a railway runs northwards to Salonika (line to Constantinople) and Jugoslavia, with branches to Kalabaka and to the coast at Volo, the port of Thessaly. From Athens, a line runs through Corinth along the coast to Kyparissia, and then inland to join a branch which crosses the Morea. Syra, or Her-

mopolis, is the coaling-station and commercial centre of the Archipelago, and exports emery and iron ore. A ship-canal across the isthmus of Corinth shortens the voyage between the *Æ*gean and Ionian Seas.

ITALY.

The Apennines divide Italy into three lowland regions—the Paduan (Lombard-Venetian) Plain, the Western Foreland between Tuscany and Campania, and the Eastern Apulian Foreland—to which must be added the islands of Sicily and Sardinia.

The north is economically by far the most important part of Italy. Cattle feed on the meadows of the surrounding mountains, and on the rich, moist low-lying lands near the Po, and silkworms on the mulberries of the forests, whose trees yield timber. Olive-groves and vineyards exist on the southern slopes of the Alps turned to the sun, but not on the northern slopes of the Apennines. The alluvial lands are irrigated by a great canal system, which the melting Alpine snows keep well supplied with water even in the driest summer, permitting two, three, or even more crops to be gathered every year. Rice can be grown, and maize (for polenta), pulses, flax, and other plants used for food or industry. In Piedmont and Venetia there is an increasing cultivation of sugar-beet. The irrigated meadow-lands can be cut four or five times a year, and supply food to the cows, whose milk is made into Gorgonzola and other cheeses.

The peninsular hilly lands are terraced and cultivated, especially in western Italy round the Arno, and in the Alban Hills. Olive-groves abound, and olive-oil is manufactured, that of Lucca being noted. Here the

flocks and herds are driven to the upper grass-lands of the Apennines in summer and to the plains in winter. The goats and their keepers have destroyed much of the old forested land, and caused great deterioration in the productivity of the hilly land.

In Sicily the irrigated lands are of exceptional fertility, yielding crops at all times. Excellent crops of wheat, barley, and beans are raised, and olive, orange, lemon, and fig groves and vineyards are found on the terraced lands. Even cotton is grown.

The resources of Sardinia have not been greatly developed; the raising of cattle and horses is the principal industry, but cereals, wine, oil, and cheese are produced and exported; the south-west has a store of minerals, and lead ore is shipped to the smelting-works at Pertusola. A large reservoir has been constructed on the river Tirso for the purpose of irrigating the plain, which extends northwards from Cagliari, and of supplying power to the mines, which formerly were compelled to pay a high price for fuel.

Italy has few minerals except the salt of its lagoons, the sulphur of the volcanic regions, the white marble of Carrara, and the iron ores of Elba and Sardinia. Silver, lead, and zinc are also found in Sardinia. Coal is almost absent, but some brown coal is mined in Tuscany. Petroleum has been found in Emilia, on the north-eastern slopes of the Apennines.

Manufactures.—The water-power of the rivers is utilised, especially for generating electricity. Production increased from 900,000 h.p. in 1914 to 1,500,000 h.p. in 1920. Silk-spinning is carried on in the villages and towns at the mouths of the Alpine valleys, and great silk-factories have been built at Bergamo, Brescia,

Como, and Milan. Cotton, wool, and jute are also manufactured in the northern towns. Mechanical engineering has made great progress in Italy within recent years. The largest iron and steel works are at Terni, where railway material, armour-plate, and ordnance are manufactured; war material is also manufactured at Pozzuoli, in Campania. Turin, Milan, Savona, along with other northern towns, and Naples are important engineering centres. At Turin and Spezia the manufacture of motor vehicles is one of the chief industries. The principal shipbuilding yards are at Leghorn, Genoa, Spezia, and Naples. Straw-plaiting is the characteristic industry of Tuscany. Venice (Venezia) is noted for the manufacture of lace and glass, Padua (Padova) for stringed musical instruments, and most of the large towns, especially Florence, Rome, and Naples (Firenze, Roma, and Napoli), for mosaics, sculptured figures, furniture, coral, and other jewellery, and *objets d'art*.

The routes from Italy to the north run on the east and west sides of the peninsula. A great line crosses the Apennines from Florence to Bologna, where it meets that running parallel to the old Æmilian Way from Ancona to Piacenza. From Turin the Mont Cenis, from Milan the St Gotthard, from Domodossola the Simplon, from Verona the Brenner lines cross the Alps; and the eastern routes diverge from Venice by Udine to Klagenfurt and Vienna, and by Gorizia to Trieste, Ljubljana, and the Save. Railway electrification has begun. The Sicilian railways are connected with those on the mainland by train-ferries across the straits from Reggio to Messina.

Venice (Venezia) is the eastern and Genoa (Genova)

the western port of the northern region, Leghorn (Livorno) and Naples of the west coast, Trieste and Fiume of Istria and neighbouring lands, Palermo and Messina of Sicily, and Cagliari of Sardinia. Brindisi and Naples are used by vessels for the Far East, and Genoa for trans-Atlantic liners.

Since the opening of the Alpine tunnels the overland trade with northern Europe, especially with Germany, has developed, partly at the expense of the sea-borne trade with the United Kingdom. The principal exports are raw silk and silk goods, cotton tissues, olive-oil, wines, eggs and cheese, fruits, hemp, hides, sulphur, and automobiles; the imports, wheat, coal and coke, raw materials, machinery, wrought iron and steel, timber, rubber, and cured fish. Most trade is done with the United Kingdom, France, Switzerland, the Balkan States, and the United States.

SPAIN AND PORTUGAL.

The bulk of the Iberian Peninsula is a plateau, separated from the Pyrenees by the plains of the Ebro, and from the Sierra Nevada by the plains of the Guadalquivir or Andalusia. These two plains and the smaller ones on the west and Mediterranean coasts are carefully irrigated and cultivated, while the hills around them are elaborately terraced. On these terraced hillsides and coastal plains oranges, lemons, grapes, figs, olives, and other fruits are grown. Maize, wheat, tobacco, and rice also flourish on the alluvial plains. From the eastern provinces large quantities of nuts, especially Barcelona nuts and almonds, are obtained. Onions and garlic are important horticultural products. Great groves of cork-oak are found in the

extreme south of Portugal and of Spain. The north-western and northern mountains receive abundant rain at most seasons, and climatically belong to central Europe. They yield timber. The climate of the plateau is one of extreme temperatures and great dryness, which prevents cultivation without irrigation. In Old Castile, which is crossed by numerous rivers from the rainy regions of the extreme north, great irrigation-works have been carried out, and the region is noted for its excellent wheat. Elsewhere on the plateau the tending of merino sheep and goats is the most important occupation. The cultivation of sugar-beet, widely distributed in the northern provinces and the central plateau, is increasing; sugar-cane is decreasingly grown in the hot south coastal districts under irrigation. Sardine and tunny fisheries are carried on round the coast.

Spain is rich in minerals. Iron, coal (in Asturias and Valencia), manganese, and other metals occur in the Cantabrian Mountains of the north; copper, silver-lead, mercury, iron and other ores, and coal are mined in the Sierra Morena in the south. The crude or half-refined ores are exported to Britain, Germany, Belgium, and other countries to be refined.

Barcelona, the chief industrial centre of Spain, is noted for its manufactures of silk and cotton. Cloth is made at Palencia, pottery at the royal works at La Granja north of Madrid; tobacco is manufactured at Seville, and iron and steel at Zaragoza. Among minor industries are paper, leather goods, chemicals, and cement. Water-power is being developed.

The railway lines radiate from Madrid, in the centre, but, with few exceptions, the important towns are on

the coast. Barcelona is the chief Mediterranean port, and acts as the outlet for the Ebro valley. Valencia, Malaga, on the Mediterranean, and Cadiz, on the Atlantic, are important fruit and wine ports. Seville can be reached by steamers. Huelva is the outlet for the rich copper-mines of the south-west. In the north, Gijon is the outport of the Asturias coalfield, and Santander and Bilbao of the iron-mines in the Cantabrian Mountains.

The chief exports of Spain are the products of its vineyards, orchards, and mines, live-stock, and food substances. Foodstuffs, cotton, raw and manufactured, machinery and other manufactured iron goods are the most important imports.

The chief exports of Portugal are wine from Oporto, cork, sardines, fruits, wool, chemicals, and olive-oil from the south through Lisbon, from which cottons are exported to Portuguese colonies. Large quantities of cacao from São Thomé are re-exported from Lisbon. Cereals, cotton and other textiles, coal, cod-fish, industrial machinery, sugar, rice, maize, and other colonial products are the chief imports. Lisbon, on the estuary of the Tagus, is an important port for vessels plying between South America and Europe. Textile manufactures are carried on in the vicinity of Oporto.

THE BARBARY STATES.

Tunis, a French protectorate, and Algeria, which forms part of France, are at present the most important of the Barbary States. They consist of a coastal range, behind which stretches the fertile Tell, drained in the east by the Majerda, and in the west by the Shelif. Here vines, olives, and other Medi-

terranean fruits, cereals, including wheat, barley and oats, maize, and to a smaller extent tobacco, colza and other oil-seeds, are grown. On the high plateaus between the Mediterranean Atlas and the Saharan Atlas the alfa or esparto grass is the chief economic product. Goats and sheep are the most important animals of the plateau, cattle and horses of the Tell, and camels in the desert, where the oases, natural or formed round artesian wells, support date-palms under whose shade maize, millet, root-crops, and fruits mature. Extensive phosphate deposits are being worked near Kef, Tebessa, and elsewhere, and now furnish the most valuable export from Tunis. Iron, zinc, and lead are also exported; petroleum has been discovered in Oran. Algiers is one of the principal coaling-stations in the Mediterranean.

The chief railway route traverses the Tell from Tunis by Constantine and Algiers to Oran and Morocco. Lines branch from it southwards to the desert, in the east to Tebessa, a phosphate region, and to Touggourt, in the west through Aïn Sefra to Colomb Bechar in the south-east of Morocco, and shorter ones northwards to the ports of Bizerta, Bône, Philippeville, and Bougie. From Tunis a railway runs south-west to the phosphate districts of Kef and Kalaa Djerda, and southwards along the coast through Susa and Sfax, with branches reaching almost to the western frontier of Tunis.

It has been proposed to extend one of the southern lines across the desert to the Sudan, but meanwhile communication is maintained by camel caravans. The principal exports from Tunis and Algeria are wines, phosphates, cereals, olive-oil, esparto grass, iron, zinc, and lead ore. The principal imports are textiles.

machinery, and hardware. The trade is mainly carried on with France.

Marocco, formerly an independent sultanate, but since 1912 a French protectorate, consists of a coastal plain, bordered by an elevated undulating country, which gives place in the south to the lofty mountains of the High Atlas, beyond which the country forms part of the Sahara region. A rich black earth, similar to that of southern Russia, extends over large areas of the coastal belt, and renders this region very fertile. The rainfall is well distributed along the coast and on the western slopes of the High Atlas mountains, but diminishes on the plateau as the distance from the sea increases, and also towards the southern part of the country. Along the coastal plain and on the lower parts of the plateau all Mediterranean plants could be cultivated; in the former, barley, wheat, and maize are grown. The steppe region of the plateau furnishes excellent pasture-land for large herds of cattle, sheep, and goats, as well as for camels, which are reared for transport. In the Sahara zone of south-eastern Marocco, the wadis, which flow southwards towards the desert, have formed oases, such as Tafilet, where the date-palm flourishes under irrigation. An oilfield exists near Fez.

The chief exports are cereals (especially barley), beans, eggs, linseed, wool, oxen, dates, almonds, and gums. The caravan routes diverge from Marakesh, or Marocco city, in the south-west, which is served by the ports of Casablanca (the principal port in the country), Mazagan, Mogador, and Saffi, and from Fez in the north, where the leading ports are Tangier and Rabat. A considerable trade also passes across the

frontier to Melilla. Under French administration railways have been laid through Fez to Rabat and Casablanca, with branches to Marakesh and other centres.

Italian Libia includes the administrative districts of Tripolitania and Cyrenaica. It is essentially part of the Sahara region, only a very small area falling within the Mediterranean region. The country contains few minerals, and its agricultural products, chiefly barley, wheat, and fruits, are scanty. Where the rainfall on the steppe is sufficient, cattle and sheep can be reared. Cyrenaica, a deeply dissected limestone plateau east of Tripoli, possesses considerable tracts with a rich soil, but the rainfall is inadequate for cultivation on a large scale. Barley is the chief crop, and the surplus obtained in good seasons is mainly exported to Scotland for use in the distilleries. In both districts olives and dates are widely grown.

Tripoli and Benghazi are the Mediterranean ports at the end of two important trade-routes across the Sahara, by which ostrich feathers are brought from the Sudan. Short railways run inland from these towns.

The principal exports from Tripoli are esparto grass, barley, and sponges.

CHAPTER XVIII

FRANCE

Position and Configuration.—France lies in the centre of the land hemisphere, between 43° and 51° N. lat. On three of its sides it is bordered by water—the Mediterranean in the south-east, the Atlantic in the

west, and the English Channel on the north-west. On the south-west it is separated from Spain by the Pyrenees; on the east from Italy and Switzerland by the Alps and the Jura; and on the north-east from Germany, Luxemburg, and Belgium by the Rhine and the Ardennes. A great Central Plateau rises in the southern half of the country, separated from the Alps by the valley of the Rhone, and from the Pyrenees by the valley of the Garonne, and drained by the Garonne and the Loire and their tributaries. From this plateau north-eastward to the Vosges runs a line of higher ground, the plateau of Langres, from which flow the Seine and its chief tributaries. The north of France is a plain, with low hills rising above it, especially in Normandy and Brittany.

Climate.—The climate of the north of France resembles that of the south of England. The winters are not very cold; the summers are not excessively hot. Rain falls all the year round, but most abundantly in autumn and winter, and more heavily near the coast than farther inland. South of the Loire there is a marked dry summer, which is of great importance for ripening the vine. In the south the climate is of the Mediterranean type—almost rainless in June, July, and August, and with most rain in spring and autumn.

Products.—Forests occur on the slopes of the mountains, on the edge of the Central Plateau, and in scattered groups, sometimes of considerable size, on the plains. Great pine-woods have been planted on the sandy Landes, south of the Gironde; oak and beech are characteristic of the northern plains, pine-woods of the mountain forests, the chestnut of the

Cevennes, the walnut of Poitou, and cork-oak and olive-groves of the Mediterranean region.

The pasture-lands of France consist of mountain meadows in the Pyrenees, on the Central Plateau, and in the Alps, and of grassy plains and hills in the north. Horses, cattle, and pigs are reared in Brittany and Normandy. Cattle are kept on the upper meadows and on the wetter lower slopes of the mountains, but are replaced on the higher regions facing the Mediterranean by sheep, which are grazed on the mountains in summer and on the deltaic plains of the Rhone in winter.

The north of France is famous for its apple-orchards and for its cider. Industrial plants, especially sugar-beet and flax, are cultivated in the north-east. The upper Allier, upper Saône, and the middle Seine basins and the extreme north-east of France produce excellent wheat. The lower lands of Aquitaine produce some wheat, and maize and tobacco are also grown. Almost everywhere in France, except in the north, the vine is important, and is made into wine south of a line from the mouth of the Loire to the Ardennes. The vineyards of Medoc, west of the Gironde estuary, produce the wines known as Bordeaux or clarets. The south is in a pre-eminent degree the land of the vine and olive. The vineyards of Languedoc are the most productive; but the vine is grown throughout the Rhone-Saône valley and as far north as Burgundy and beyond to Champagne, where the wines known by these names are produced. The olive-oil of Provence is remarkable for its delicate flavour. Oranges, figs, and other Mediterranean fruits are also grown in

the south, and the mulberry is cultivated as food for silkworms. Within recent years, chiefly as a result of improved transport facilities and the extension of irrigation, a remarkable development has taken place in the production and distribution of flowers, fruits, and vegetables, especially in the neighbourhood of Paris, where rich manures are obtainable from the city, and in the Rhone valley. From Avignon, these products can be delivered in London in thirty-seven hours, and in Berlin in seventy-two hours. Along the Atlantic coast the fisheries are important; large numbers of the inhabitants of Brittany are engaged in oyster fishing and the sardine industry, which, however, is more important in the south, where the small anchovy and the large tunny are also fished.

Minerals and Manufactures.—France is rich in iron, which is found round the Central Plateau and in the north-east, but most largely in Lorraine (which produced 8,000,000 tons out of a total 14,000,000 tons in 1920), near Cherbourg, and at Châteaubriant and Segré in the west. France ranks second to China in the world's production of antimony, found mainly in the Auvergne; other important minerals are silver, potash, zinc, and bauxite. Coal, however, is relatively scarce. The Pas-de-Calais and the Moselle basins are the most important coalfields, and are the centre of rich manufacturing districts. To these must now be added the Sarre (Saar) coalfield, the coal of which, however, is not suited to the production of coke for iron working. Round the Central Plateau are grouped small fields which support a variety of industries. In the iron and steel industry the largest number of blast-furnaces are found in the eastern districts. Iron, steel,

and machinery are made at Le Creusot near the Blanzy coalfield, cannon and other firearms at St Etienne, steel on the Alais and Carmaux fields, porcelain and glass round Limoges, woollen and textiles in Languedoc, and silk at Lyon and St Etienne. On the Valenciennes field, Lille manufactures machinery, railway material, textiles, and chemicals; in this region the motor-car industry has developed very rapidly. Large steel-works are also in operation at Rouen and Dunkirk. Valenciennes, Cambrai, and towns in Normandy and Maine are noted for fine linens and lace. Woollen goods are made at Roubaix, Tourcoing, Amiens, and other towns, and south of the Ardennes at Reims and at Elbeuf on the Seine. This industrial north-eastern region, containing 80 per cent. of French woollen spindles, 95 per cent. of flax spindles, and 30 per cent. of cotton spindles, suffered most severely the effects of the late war, but its recovery has been very rapid. The restoration of Alsace to France has added almost 2,000,000 to her (1913) number of cotton spindles, giving her first place on the continent in the cotton industry with over 10,000,000 spindles. The great seats of this industry are Mulhouse (Mülhausen) in Alsace, Lille, Tourcoing, Roubaix, and Rouen. The raw material is obtained from America, India, Egypt, and elsewhere. Rich deposits of bauxite, especially at Baux and Brignoles, shipped from Marseilles, Toulon, and St Raphael, have given rise to a remarkable development of the manufacture of aluminium, for which there is an increasing demand in the electrical industries. The Alsatian deposits are estimated to contain about 300,000,000 tons of potash salts.

Marseilles is an active industrial centre, with oil

and sulphur refineries, soap and chemical works, sugar and flour mills, all utilising the raw materials discharged at the wharves of the port. Cane-sugar is also refined round Bordeaux and Nantes. Paris is the centre for the manufacture of *objets d'art*, clothing, &c., and near it are the famous porcelain-works of Sèvres. Clocks and watches are made in the neighbourhood of Besançon.

Shipbuilding is important along the Mediterranean seaboard, the principal yards being at Marseilles, La Ciotat, La Seyne, and Port de Bouc; on the Atlantic coast at Dunkirk, Le Havre, Rouen, St Nazaire, and Nantes. Toulon, Brest, and Cherbourg are great naval stations.

Internal Communication and Trade Centres.—Water-traffic is exceedingly important, and great attention is paid to the canalisation of rivers and the construction of canals. The heaviest water-traffic is between Paris and the northern industrial region by the Oise, from which canals run to the Sône, Sambre, Schelde, Lys, and other northern rivers, as well as to Dunkirk. The Aisne is connected by canal with the Marne, from which canals communicate with the upper Saône and with the Rhine at Strasbourg. The Seine is canalised from the Yonne to its mouth, and connected by canals with the Loire and the Saône, the latter continuing the traffic down the Rhone to the Mediterranean and up the Doubs to the Rhine. Canals join the Garonne to the Mediterranean (Canal du Midi), and Marseilles to the Rhone.

A network of railways, mostly radiating from Paris, covers the country. The Western line opens up Normandy and Brittany, and is connected with the chief

northern ports, Brest, Cherbourg, Le Havre—the most important—and Dieppe. The Northern line connects the capital with the northern industrial district and the northern countries of Europe, and through Calais and Boulogne carries a large proportion of the Channel passenger traffic. The Eastern line passes to the upper Meuse and Moselle, the route by Nancy forming part of the Orient Express route to Constantinople, that through the Burgundian Gate leading to Switzerland. The Paris-Lyon-Mediterranean line, which carries most traffic, passes by the Yonne to the Saône-Rhone valley, connecting with the Swiss lines through Dijon and Pontarlier, and with the Italian lines by Macon and the Mont Cenis tunnel or by Marseilles and the Riviera. The Orléans line, the only other important line with a Paris terminus, sends branches from Orléans to St Nazaire by Nantes, to Bordeaux by Poitiers, and to Toulouse by Limoges. The poorer parts of the west are served by the State line. Bordeaux, Toulon, and Cette are connected by the South line (Midi), which runs to the Spanish frontier both east and west of the Pyrenees. French lines are to be electrified. The central Pyrenees have been tunnelled at Canfranc, and the railway has been continued through Jaca to the Spanish system. International lines are also in progress from Ax, in the Ariège, to Ripoli, in Catalonia, and from St Gérons through Sort and the Noguera Palaresse valley to Lerida.

Ports.—Marseilles (Marseille), the most important as well as the most ancient port in France, is situated on a magnificent harbour to the east of the Rhone delta, and not on the delta itself, owing to the shallowness and variability of the distributaries. It is

the outlet for the produce of the Rhone valley, and the great storehouse into which are brought raw silk from the East to be manufactured at Lyon, raw cotton from Egypt and India, wool from Australia, palm-oil seeds from West Africa, linseed and other oils from India, copra from the South Seas, wheat from the Black Sea, and sheep and wines from Algeria. Cette is the wine-port of fertile Languedoc.

Bordeaux, at the head of the Gironde estuary, is the outlet for the wine of the district, and carries on a large trade with South America, where finer manufactured articles of French, and particularly Parisian, origin are in great demand. In addition to wine, dried plums and ligneous products, from the Landes, are exported. Rubber from the French African colonies, wool from the Plate, coal from the United Kingdom, iron ore from Spain, sulphate of copper, which is required by the vine-growers, and bananas from Teneriffe are among the chief cargoes brought into its wharves. Accommodation has been provided for deep-draughted vessels at Pauillac, nearer the mouth of the estuary; but many commodities, such as grain and rice, which cannot reach Bordeaux conveniently by water, are conveyed by rail from Marseilles, even to points actually within the commercial zone of Bordeaux.

La Rochelle-Pallice has for its hinderland a rich wine-producing and dairy-farming country, but the railway system which serves this part of the coast is isolated from the rest of France by the Orléans Railway, which diverts the traffic either to Nantes and St Nazaire or to Bordeaux. The import trade includes coal from the United Kingdom and Germany, timber from northern Europe and America, wines and

phosphates from Algeria. The principal exports are wines, brandy, and pitwood.

Nantes, with its outport St Nazaire, at the mouth of the Loire, has a large trade with the West Indies and Central America, importing sugar in large quantities, and timber and coffee from Brazil; but coal is the principal import. In addition to preserved fruits of various kinds, it exports the iron ore from the mines at Châteaubriant and Segré.

Le Havre, at the mouth of the Seine, is the second port of France, and is a European warehouse for coffee, imported mainly from Brazil; along with Bremen it forms the principal cotton-market on the Continent. Cotton, wheat, and tobacco are imported from the United States. The port is the outlet for the cottons manufactured in the lower Seine.

Rouen, which enjoys the advantage of a maritime waterway to the sea and a fresh-water route to Paris, is an important distributing centre. The raw material for its oil-refineries is imported in tank ships from the United States. Other valuable imports are Algerian and Tunisian wines, coal (mainly from the United Kingdom), and timber.

Dunkirk (Dunquerque or Dunkerque), although an artificially created port, now ranks fourth among the ports of France; it competes with Le Havre for the trade of northern France, but finds a rival in the port of Antwerp. It is a large market for wool; the first bale was imported in 1880, and now France imports about eight times as much wool as she produces, mainly from Australia and the Argentine. It imports from the United Kingdom and Spain much of the raw material required in its shipbuilding yards, timber

from Scandinavia and Canada, rice from Indo-China, and jute from India.

The principal imports at Calais are coal and iron ore, and wool and hides, chiefly from Australia.

Le Havre and Cherbourg are the passenger ports for the United States. St Malo, Cherbourg, Dieppe, Boulogne, and Calais are important packet-stations for England, to which dairy and horticultural produce and other goods are exported. All these are fishing-stations, sending vessels to the North Sea, the Iceland and the Newfoundland fishing-banks. Strasbourg is the principal port on the Rhine.

Trade.—The foreign import trade by land is chiefly in coal, iron, and zinc along the north-east frontier; cattle from Austria; cheese, clocks, and watches from Switzerland; and cattle, raw silk, and ice from northern Italy through the Mont Cenis tunnel.

In food-stuffs France is more self-supporting than Britain or Germany, and normally* imports little. The chief imports are coal and timber, raw wool, silk, and cotton, oil-seeds, coffee, machinery, petroleum, wine, and cereals; while the manufactured articles form a smaller proportion of the imports than in either the United Kingdom or Germany. On the other hand, France exports little raw material, mainly silk and wool, which in the manufactured state form, along with cotton goods, the most important exports.

Wine, small-wares, leather and leather goods, linens, and motor-cars are next in importance, followed by elaborated products of the farms, cheese and butter, skins and furs, and chemical produce. The United Kingdom sends coal, woollen goods, machinery, cotton,

* As a result of the War, cereal imports have increased.

goods, and chemicals, and takes from France silk and woollen goods, motor-cars, wine, sugar, butter, leather, lace, brandy, and eggs.

CHAPTER XIX.

ALPINE AND DANUBIAN LANDS.

SWITZERLAND.

SWITZERLAND consists of the central ranges of the Alps, the great valleys running between and from them, the plateau to the north, and part of the Jura Mountains, which form the western limit of the plateau. The climate and products of the plateau resemble those of southern Germany; those of the Rhone and Ticino valleys resemble the conditions of northern Italy.

Switzerland, in ordinary parlance, means the high Alpine region, the beautiful scenery of which annually attracts thousands of tourists to the country, rendering hotel-keeping an important and profitable occupation during the summer. It is estimated that the capital invested in hotel enterprises amounts to milliards of francs; and foreign tourists annually spend huge sums in the country. The Alpine pastures support large numbers of cattle and goats, which are driven to the valleys in winter. These pastures are too remote from a market for the milk to be sold in a fresh state, and the surplus is either made into cheese or condensed and canned. The Switzerland of commerce, however, lies on the plateau, and along the great lakes and rivers which flow out of them, more particularly the Rhine, Reuss, Aar, and Rhone. The

vine is cultivated on the lower southern slopes to the west of the plateau, and in the Rhone and Ticino valleys. Cereals, potatoes, and fodder plants are grown on the plateau. Bee-keeping is important, and the silkworm is reared in the Ticino valley and the Grisons.

Switzerland is poor in minerals, but some iron has been found near Meiringen in the upper Aar valley, and exists in the Jura. Water-power is abundantly supplied by innumerable waterfalls and rapids, fed by the Alpine snows, which can either be used directly for turning machinery or transformed into electric power. The mountain and tunnel railways are electric, electric lighting is universal, and electric power common.

The industrial activity of Switzerland is very great, and supports two-fifths of the inhabitants. Machinery of all kinds, especially electric, is made at Zürich and Winterthur. Cotton is manufactured at Zürich and Luzern, embroideries at St Gallen (St Gall) and Thurgovie, and silk at Zürich and Basel. Clocks and watches are made at Geneva, and at Le Locle and La Chaux de Fonds in the Jura. Electrical apparatus is manufactured at Geneva and Neuchâtel; scientific instruments and motor vehicles are made at Geneva. The manufacture of chocolate is important at Luzern and Neuchâtel, and of cheese and condensed milk at Bern and Luzern. There are large chemical-works at Basel and Geneva. Straw-plaiting and the making of straw goods are carried on at Argovy, the manufacture of shoes at Soleure, and of aluminium at Rheinfelden.

Routes.—Switzerland is crossed by a number of important trade-routes. Those from the west enter at Geneva or Basel at the south and north ends of the Jura, or else cross these mountains to Lausanne

and Neuchâtel. Geneva and Basel are joined by a line at the eastern base of the Jura, which passes through Neuchâtel, and by another which runs by Lausanne and Bern. From Basel or Bern the line to the east passes by Zürich through the Vorarlberg tunnel; and to the south by Luzern, the St Gotthard tunnel, and the Ticino valley by Lugano to Milan; a third route to northern Italy is provided by the line running eastwards from Geneva through Brig and the Simplon tunnel. From Brig the railway is continued through Andermatt to Dissentis in the Farther Rhine valley. The Lötschberg tunnel through the Bernese Alps, between Kandersteg and Goppenstein in the Lötschen valley, opens up a direct route from western and north-western Europe, through Bern, Thun, and Spiez to Brig and the Simplon.

The new line from Martigny to Orsières may be regarded as the beginning of another international route to northern Italy, through Aosta and the Dora Baltea.

The Rhine is navigable from Strasbourg to Basel, and provides an important route for the carriage of heavy commodities which demand low freights; by this waterway coal from the United Kingdom reaches Switzerland.

Trade.—The chief trade is with the United Kingdom, France, Germany, the United States, and Italy; the imports are slightly in excess of the exports. Notwithstanding the disadvantage of its internal situation, Switzerland does a large trade with the United Kingdom, of which 67 per cent. consists of exports. Trade is also carried on with Austria and Denmark. Much of the food of the country is imported, as are also the

raw materials of its manufactures, raw silk, cotton, and wool, coal, and useful metals and minerals of all kinds. Manufactured goods, especially silks and cottons, watches and clocks, machinery, and elaborated food products, especially chocolate, cheese, and condensed milk, together furnish 85 per cent. of the exports. Switzerland, because of its central situation in Europe, is the headquarters of the League of Nations, the International Postal Union, and other important commercial and industrial unions.

AUSTRIA.

Austria.—The Alpine and Danubian regions of Austria consist of the valley of the Danube, between the Inn and the Morava (March), and the eastern Alps drained to the Danube, with the exception of the Engadine. The valley of the Adige (Etsch) now forms part of the Italian Trentino. Wheat, maize, and other cereals are cultivated in the lower valleys of the Danube. In the Alps mountain pastures and forests replace agricultural land, except in the valleys. Those opening to the south and east are planted with the vine and mulberry.

Minerals are abundant in the eastern portion of the eastern Alps. Iron is found in Eisenerz and Vordernberg in northern Styria, lead at Bleiberg, lignite in northern Styria and near Graz, salt at Salzkammergut, in northern Tirol, and in Salzburg, and china-clay west of Linz.

Manufactures of very varied kinds are carried on in and around Vienna, the capital of the republic, including shipbuilding for the Danube trade. Silk is manufactured in the south of Tirol and in Vorarlberg.

Railways are most numerous in the Danube valley, where the Orient Express line follows the river. At Vienna an important line from Czechoslovakia crosses the river to run south through the Semmering tunnel and by Graz into Yugoslavia, whence it passes by Ljubljana to Trieste in Italy. At Innsbruck the Brenner Pass route to Italy diverges down the Adige (Etsch) valley, and the Vorarlberg route runs westward to Switzerland. The Danube is navigable throughout the republic.

CZECHOSLOVAKIA.

Czechoslovakia, the land of the West Slavs, includes Bohemia, Moravia, part of Silesia, Slovakia, and Ruthenia. Bohemia is a plateau, bordered by the mountains of the Bohemian Forest (Böhmerwald), the Ore Mountains (Erzgebirge), and the Sudetes Mountains. It is drained to the north by the Moldau (Vltava), the chief tributary of the Elbe (Labe), which rises in the Sudetes Mountains. The climate is extreme, with cold winters and hot summers. The rainfall is small except in the mountains, and is heaviest in summer. One-third of the surface is forested, and more than one-half is under cultivation. Wheat, oats, rye, barley, flax, hops, and sugar-beet are the principal crops. Minerals are abundant in the mountains, including silver, lead, copper, tin, and iron. Coal is widely distributed, and extensively worked in the north. From the pitchblende mined at Joachimsthal (Jáchymov), in the north-west of Bohemia, a large part of the world's supply of radium is obtained. A little gold is obtained from the Roudny mines near Praha (Prague), and silver at Příbram.

Industrially, Bohemia, with coal and abundant

water-power resources, is one of the most active regions of Europe. Sugar, beer, and brandy are manufactured, Pilsener beer having a world-wide reputation. Paper, porcelain, glass of fine quality, iron and steel goods of all kinds, woollens, linens, and other textiles are also made, and dyeing and calico-printing are carried to great perfection. Praha (Prague), the capital of the whole republic, on the Moldau, is the most important manufacturing town, and the centre of routes which radiate in all directions. Reichenberg (Liberec), in the north, is the centre of the woollen manufacture. Carlsbad (Karlovy Vary) is the most popular of many health resorts.

Moravia, with Silesia along its northern boundary, is mainly the valley lands of the upper Oder and March (Morava) rivers, which form the Moravian Gate between Germany and Austria. Silesia has rich coal-fields, and there, as on other highlands, sheep-rearing supplies wool to large factories at Troppau (Opava) in Silesia, Brünn (Brno), and Iglau (Jihlava) in Moravia. Slovakia and Ruthenia lie along the southern slopes of the Carpathian Mountains. There industries are scarcely developed, and lumbering, live-stock raising, and some mining are the principal occupations. To allow of freedom for marketing produce, part of the Danube plain was included within the Czechoslovak boundary, and the important river port of Bratislava (formerly Pozsony or Pressburg) was handed over to the Czechs.

Woollens, sugar, glass, timber, coal, and iron are exported; the most valuable imports are cereals, cottons, and woollens.

The main communications, both rail and water, run

north and south, but the Czechs are planning better railways and the cutting of canals from Bratislava on the Danube to Prague on the Elbe and to the Oder, and from the Elbe by the Moldau to Regensburg (Germany) on the Danube, to facilitate intercourse between east and west. Most of the foreign trade is with neighbouring countries. Extra-European trade passes mainly along the Elbe by Hamburg.

HUNGARY.

Hungary lies between 46° and 48° N., and is about one-eighth larger than Ireland in area. It occupies the centre of a vast grassy plain, surrounded by forest-clad mountains. In climate and products it somewhat resembles southern Manchuria in the same latitudes. It is crossed by the Danube and its tributary, the Tisza (Theiss), while the Maros from the Transylvania Alps, and the Drave from the Carnic Alps, form parts of the southern frontier.

The forests yield excellent timber. The grassy plains, or *pusztas*, support vast numbers of horses, cattle, and pigs. Many parts have been brought under cultivation, yielding rich crops of wheat, maize, barley, oats, rye, and potatoes. Sugar-beet and tobacco are also cultivated. The wines of the upper Tisza valley, named after Tokay, are famous.

The mineral wealth of Hungary is not great. Rock-salt, gold, and silver are found in the foothills of the Carpathians in the north-east. Coal is mined in the district round Pécs (Fünfkirchen); there is much brown coal and lignite.

Hungary is a pastoral, lumbering, mining, and agricultural country, and its manufactures are based on

agriculture. Breweries and distilleries, flour-mills, and sugar-factories are widely distributed, and utilise many of the local agricultural products. The dry air of Hungary is favourable to the manufacture of excellent flour, much better than can be obtained from Hungarian wheat ground in Britain. The textile industries have made some progress, and many articles formerly imported (for example, agricultural implements from the United Kingdom) are now manufactured in the country. Budapest mills flour, manufactures jute for flour-sacks, and also makes machinery, spirits, and transport material. From Fiume, an Italian port on the Adriatic with an important shipbuilding yard, some flour is exported, the bulk of the unmilled grain, however, as well as large quantities of flour, being exported down the Danube.

The exports are wheat and flour, live-stock and animal products from the plain of Hungary, sugar, eggs, and manufactured goods. The imports are cotton and cotton goods, wool and woollens, coal, silk and silk manufactures, machinery, hemp and jute, coffee and tobacco. The chief trade is with Czechoslovakia and Austria. The Danube is the great commercial artery of the country, across which it is navigable.

The Orient Express route passes through Budapest, following the valley of the Danube into Yugoslavia. From Budapest lines pass across the Carpathians to Russia, across the Transylvanian Alps of Romania, and to the Adriatic at Fiume.

ROMANIA, OR RUMANIA.

Romania includes the Highlands of Transylvania, the plain between the Transylvanian Alps and the

Danube, the hill country between the Eastern Carpathians and the Dniester, the delta of the Danube, and the Dobruja to the south. It is a well-forested mountain land, sinking to a fertile loess-covered foreland, across which the rivers cut their way in deep valleys. One-fifth of the land is forested and about one-third cultivated. Wheat and maize are by far the most important crops, but barley and other cereals, grapes, plums, damsons and other fruits, beetroot, colza, tobacco, and flax are also grown. Live-stock are numerous, the number of sheep and goats exceeding that of cattle and swine. Romania is one of the principal petroleum-producing countries of the world; about 85 per cent of the Romanian output is obtained in the district of Prahova. The oil serves as fuel to a large extent in the local factories and on the railways, but the bulk of the production is conveyed by rail or pipe-line to Giurgiu on the Danube or over the bridge at Cernavoda to Constantsa for export. Salt of remarkable purity is found along the southern foothills of the Transylvanian Alps. Lignite is mined between the Dambovitză and Ialomița rivers, coal in the Banat. The gold mines of the Aranyos valley (Transylvania) are the richest in Europe. Iron, copper, lead, and manganese are also mined.

The oil-refineries, distilleries, flour-mills, sugar and tobacco factories, and saw- and paper-mills, utilise local products; but within recent years marked progress has taken place in the textile industries.

Cereals are by far the most important export, petroleum, timber, vegetables, and fruit coming next. A very large proportion of the wheat is sent to the grain markets at Antwerp and Rotterdam, where it

is mixed with Hungarian, Russian, and Bulgarian grain, and sold as Danubian wheat. Manufactured goods of all kinds, colonial produce, and chemicals are the chief imports.

Bucarest (or Bucuresti), the capital, close to the border of the Wallachian and Moldavian plains, is the commercial and industrial centre from which railways radiate. Lines cross the mountains to Hungary, the Danube to Constantsa (Kyustendja), a port on the Black Sea, and through Moldavia, of which Jassy (Iasi) is the chief town into Bessarabia, where fruits are cultivated, collecting agricultural produce. Timber is floated down the Sereth to the Danube from the forested mountains. The Danube is navigable through Romania. Soon after it enters the country it traverses a narrow gorge or klissura, at the end of which a canal has been constructed to avoid the shallow rapids at the Iron Gates, where Orsova is built. The grain is carried by lighters to Braila, Galats, and to Sulina on the delta, where it is loaded for export.

YUGOSLAVIA.

Yugoslavia—the Serb, Croat, and Slovene State—is inhabited by the South Slavs. It is mountainous south of the Save and Danube, where it is drained by the Morava and Vardar, but includes that part of the Danube plain south of the Hungarian border. The Dalmatian Coastal Region is mountainous, and fringed by islands. Fishing is an important occupation. This region possesses abundant water-power, of which, however, little use has yet been made. There are cement-factories at Spalato, a seaport on the Adriatic, and calcium carbide works at Sebenico,

where the power is derived from the Kerka falls. Yugoslavia abounds in oak and beech forests, especially in Bosnia and Herzegovina, in which feed vast herds of swine. Cattle, sheep, and goats are also reared. In the highland valleys rich agricultural basins (polyen) occur, and in these population tends to concentrate. The Kosovo polye, in the upper Ibar valley, the Metoya polye of the White Drin basin, the Tetovo (Kalkandelen) basin of the upper Vardar, and the Monastir basin are the largest. Maize is grown for food, wheat for export, while vines are cultivated in the north-east. Plum-orchards are found in all parts, whose fruit forms prunes when dried, and brandy (*slivovitsa*) when fermented and distilled. Olives are cultivated in Dalmatia. The mineral wealth is great, but not greatly developed at present through lack of good roads and capital. The annual output of coal is between two and three million tons, about half from Slovenia; iron is mined in Bosnia; other minerals are copper, lead, chrome, and antimony. Belgrade (Beograd), on the Danube, at the mouth of the Save, is the capital and chief town, from which the Orient railway follows the Morava to Nish, where it branches to Sofia and Constantinople in the east, and to Salonika in the south. Domestic manufactures are still by far the most important, especially carpet-weaving at Pirot in south-eastern Serbia. Farm produce and timber are the principal exports to Austria, Czechoslovakia, and Italy. The total trade with the United Kingdom in 1922 was valued at about £1,300,000. Most of the foreign trade passes by the railways and waterways diverging from Belgrade or by the foreign ports of Trieste, Fiume, and

Salonika. A line from Brod, on the Save, runs to the Adriatic at Ragusa (Dubrovnik); from Zagreb (Agram), higher up the Save, lines reach Trieste and Fiume.

BULGARIA.

Bulgaria lies to the east of Serbia (Yugoslavia), and includes the Balkan Mountains, a limestone foreland to the north, and the Tunja and upper Maritza valleys (Eastern Rumelia) to the south. The deeply incised valleys of the Balkan foreland are fertile strips across a bare plateau, which ends in a more fruitful belt of loess near the Danube. Wheat, maize, and barley are the chief crops. In the southern valleys there are many fragrant rose-gardens, whose flowers are used to make the famous attar of roses. Vineyards are numerous, tobacco cultivation is of some consequence, and plum-orchards are common in the north. Silk-worms are reared, and some cotton is grown. The mountains are forested, oak and beech predominating. Sheep, goats, and cattle are the most important live-stock.

The industrial development of Bulgaria is beginning. Coal (at Pernik) and iron are the chief minerals worked. Modern factories exist in Sofia, the capital, woollen-mills at Gabrovo, and cotton-mills at Varna. From Sofia, the railway runs through Plevna and Trnovo to Varna, a port on the Black Sea, with branches running northwards to the river-ports at Vidin and Ruschuk, and to Dobritch (Romania). Another line passes eastwards on the southern side of the Balkans to Philippopolis, and branches through Zagora to Burgas on the Black Sea, while the main

line of the Orient route passes down the Maritza valley to Adrianople (Turkey). A line runs south-west from Sofia through Kustendil.

ALBANIA.

Albania is a highland country, about twice the size of Wales, lying along the eastern shore of the Strait of Otranto. At present it is a monarchy, but is still in a state of economic undevelopment, is without banks or currency, and practises primitive agriculture and pastoral pursuits. Some flour is milled, wine and olive-oil are prepared, cheese is made, and wool is woven into coarse stuffs for domestic use. There are military roads in the south, and trade routes from Durazzo and Tirana to Scutari in the north. Railway construction is just being begun. The chief ports are Valona and Durazzo. Small steamers can ascend the Boyana River to Scutari.

CHAPTER XX.

GERMANY, DANZIG, AND POLAND.

THE German Commonwealth, officially styled the *Deutsches Reich* (German Empire), stretching between the northern slopes of the Alps on the south and the Baltic Sea on the north, and between the mouth of the Ems on the west and Poland on the east, includes the outlying province of East Prussia. It is farther from the equator than any part of the southern hemi-

sphere considered except Patagonia, and corresponds in latitude with Newfoundland in the northern hemisphere.

Configuration.—Physically, Germany consists of two very different regions, the Southern Highlands and the Northern Plains.

The Southern Highlands are formed of rounded hills covered with thick forests, except on the highest summits, and well-developed valleys, whose lower slopes and bottoms are cultivated. The upper Danube and its tributaries flow across a plateau to the south of which rise the Alps, and to the north the German Juras. The middle Rhine, now the boundary with France, passes down a very fertile rift-valley, twenty to twenty-five miles wide, between the Black Forest (Schwarzwald) and the Vosges, before it enters a gorge in the Lower Rhine Highlands. The Neckar and Main, its chief tributaries on the right bank, drain the escarpments and gently sloping regions of the German Juras. Another lower fertile region lies between the hills of Thuringia and the Harz. These hills are drained to the Weser in the west, and to the Saale and Elbe in the east.

The Rhine, shortly after reaching the lowlands, makes a great delta, which forms part of Holland and Belgium. To the east of the delta a belt of lowland extends through Poland to Russia and permits easy communication, which is interrupted here and there by marshes. It is bounded on the north by a band of higher ground, rugged, covered with pine-woods, and dotted with lakes and lakelets, due to morainic accumulations, and known as the Baltic Heights. The estuaries of the Weser and Elbe form convenient

openings from this lowland to the North Sea. The Oder, a German river, and the Vistula and Memel (Niemen), whose lower courses form the western and eastern boundaries of East Prussia, flow to the Baltic between morainic heights. They enter lagoons (*Haffen*), separated from the sea by sandpits.

The Baltic Sea, the Central Lowlands, the Main, and the Danube valleys all facilitate communication between east and west. The other rivers permit ready transport between north and south across the lowlands, but only the Rhine acts as a route uniting the north and the margin of the Alps.

Climate.—Germany extends as far north as England, and as far south as the Loire in France. It is, however, farther removed from the influence of the ocean, and has therefore hotter summers, colder winters, and less rain than the corresponding regions of England and France. The range of temperature increases and the rainfall diminishes from west to east and from north to south. The mean annual temperature varies little from north to south, as the gradual rise of the land from the Baltic to the Alps compensates for the lower latitude. The climatic conditions are comparatively uniform, the main divisions being the colder, drier east; the milder, wetter west; and the south-west, with its very dry autumns.

Plants and Animals.—Less than one-tenth of Germany is unproductive, one-quarter is covered with forests, one-sixth with meadows, and nearly one-half consists of arable land. Three-quarters of the forests are pine-woods, which clothe the upper slopes of the Southern Highlands, and are also found in parts of the Northern

Lowlands; the remainder is composed of mixed woods, wherein beech predominates, on the lower slopes of the hills. The forests of Germany are regarded as a valuable national asset, and they are under highly skilled supervision.

The eastern half of the plain, especially Prussia, and the Bavarian plateau are noted for horses. Sheep are kept on the undulating heights south of the Baltic. In Saxony and Silesia sheep are relatively few in number, but their wool is famous for its quality. Cattle are most numerous in the meadows of the highlands and the western plains. The eastern plains support pigs and poultry of all kinds, geese being a specialty of Pomerania. The lowlands south of the Baltic Heights, the lower part of the Danube plateau, and the Rhine plains are the most important agricultural regions. Of cereals, rye is the most extensively cultivated, and is still the staple cereal food in many parts of Germany, especially in the east. Except in the extreme north-west, more than 10 per cent. of the lowlands are cultivated with rye. Wheat is chiefly grown in the valleys, and oats on the hillsides of the highlands. Some buckwheat is grown in the sandy soils of the north, and some maize in the extreme south. The sugar-beet is extensively grown on the plains. Flax is cultivated in the east of the Baltic Heights, and to a smaller extent in upper Silesia. Hops are grown on the Bavarian plateau and in the upper Rhine district. The vine is widely cultivated, but does best on the hilly slopes above the Rhine and its chief tributaries, which face the sun.

Both the North and Baltic Seas are well stocked with edible fish. Herring-fishing and cod-fishing are

important occupations. Fresh-water fish are numerous in the rivers and lakes.

Minerals.—Germany is very rich in minerals, more particularly in coal and iron. The chief coalfields are in the Ruhr valley of Westphalia, Saxony, and Silesia. Most of the German iron ore production is obtained in Westphalia, Rhenish Prussia, and Silesia. The Harz Mountains produce silver, lead, and copper. The Ore Mountains (Erzgebirge) yield tin. Silesia and west Prussia are noted for zinc. Salt is mined at Stassfurt and Halle, in Prussia and in Saxony. Many varieties of excellent building-stone are found, as well as clay suitable for bricks, pottery, and porcelain.

Manufactures.—More people are engaged in manufacture than in agriculture. The modern factory system has developed greatly since the formation of the former empire. The chief industrial regions are Rhenish Prussia, Westphalia, Saxony, Bavaria, Silesia, and the district round Berlin. All kinds of steel and iron goods are manufactured at the three great coal-fields—Westphalia, the Rhine Province, and Saxony. Within recent years there has been a remarkable development of the electrical industries, in which Germany holds the leading place. The total number of spindles in the textile industries shows a decrease, especially in cotton, since the war. The principal seat of the woollen industry is in Saxony and Silesia, in the vicinity of Görlitz, Chemnitz, and Liegnitz, and in the Rhine Province. Silesia is also the centre of the linen industry, for which much locally grown flax is used. The cotton industry of Germany is not localised to the same extent as the United Kingdom,

but the principal centres are Prussia, Saxony, and Bavaria. Cotton spindles have decreased from 10,400,000 in 1914 to 7,400,000 in 1921, owing to the loss of Alsace, the towns with the largest number being Augsburg, Grönau, and Werdau. The water-power of the Southern Highlands is increasingly used. In many cases it is converted into electricity, which is employed for driving machinery, illumination, traction, and an increasing number of industrial and domestic purposes.

Beer is largely made in all parts of Germany. The distilling of alcohol, especially from potatoes, is an important industry along the lower Rhine and the lower Elbe. The extraction of sugar from beet-root is of great consequence in Silesia and in the lowlands between the Elbe and the Weser, where the chief centres are Halle, Magdeburg, and Hamburg. Germany has become the most important manufacturer of chemicals of all kinds, an achievement due to the careful training of experts.

Germany takes a foremost place in what may be called the higher industries, such as the making of scientific and musical instruments. Leipzig ranks with Paris and London as the great book-market of the world.

Inland Trade and Trade-Routes.—The main trade-routes of Germany either follow the rivers, which flow from south-east to north-west, or pass east and west across the Northern Lowlands and the valleys of the Main and the upper Danube. The large towns are all on navigable waterways.

Ulm, at the head of navigation on the Danube, lies where the Orient Express route reaches that river

from the Neckar and the Rhine. Munich, on the Isar, which flows across the Bavarian plateau, is an important railway centre and the focus of the traffic passing across the Alps by the Brenner Pass. It is an important industrial centre, especially for the manufacture of railway material and of artistic furniture and china. Regensburg (Ratisbon) is built where the route from the south by the Brenner Pass and the Inn crosses the Danube to the north, passing through Nürnberg (Nuremberg), on the Rednitz, famous for its toys. A ship canal is projected between the rivers Main and Danube. Karlsruhe, in Baden, and Darmstadt, in Hesse, are growing industrial towns on the Rhine plain. Karlsruhe has been transformed into a river-port by the construction of a short branch waterway to the Rhine. Mannheim, a large river-port at the confluence of the Neckar and the Rhine, manufactures steel and iron goods and chemicals. Mainz, or Mayence, situated on the left bank of the Rhine opposite the entrance of the Main, is a busy commercial town, with much river and railway trade.

Frankfurt-am-Main is a commercial centre, the meeting-place of many important routes—e.g. the east and west routes by the Main valley, and the north and south routes by the Rhine, or on either side of the Vogelsberg to the Weser. Among its more important manufactures are jewellery, electrical apparatus, and motor vehicles.

Köln (Cologne) is the most important commercial centre in the north-west, where the great routes from Paris and Brussels cross the Rhine on their way to the sea. Its woollen and cotton and chocolate manufactures, and distilling and engineering works, are

important. To the west, Aachen (Aix-la-Chapelle) is a woollen centre. To the north, round the Ruhr coal-field, many important towns have grown up. Barmen-Elberfeld produces principally textiles and chemicals; Mulheim, Remscheid, and Solingen all kinds of iron and steel manufactures; Essen armour-plate and armaments (at Krupp's works). Dortmund, Bochum, and Gelsenkirchen have iron and steel works, breweries, distilleries, and furniture-works. Crefeld, to the west of the Rhine, has important silk-mills. Düsseldorf is the centre of extensive iron and steel and chemical works, and also contains the largest glass bottle factory in the world. Düsseldorf, Duisburg-Ruhrort, and Köln are the chief river-ports, Duisburg-Ruhrort having the largest inland harbour on the Continent.

Cassel, on the Fulda, manufacturing machinery and railway material and pianos; Hannover (Hanover), on the Leine, an important railway and canal centre, producing cotton goods, chemicals, and machinery; and the great seaport of Bremen, are the chief towns, in the basin of the Weser.

Plauen, Zwickau, and Chemnitz are the chief towns on the Saxony coalfields which manufacture textiles. Freiberg is a mining centre. Dresden, on the Elbe, and Leipzig, on the Elster, where two tributaries join it, are both important meeting-places of many routes, and have rapidly growing industrial quarters, in which machinery and leather manufactures are carried on. Leipzig is also famous for its textiles, paper-making, and printing. Its fur and book markets control the trade in these articles in Central Europe. Dresden china is made at Meissen, on the Elbe.

There are numerous little manufactories in the

valleys of Thuringia. Gotha is famous for its maps, Jena for its glass and scientific instruments. Halle, on the Saale, is an important transport centre, manufacturing sugar and salt. Magdeburg, on the Elbe, is another transport centre, in whose rapidly growing industrial quarters sugar, machinery, pottery, and paper are manufactured.

Breslau, the commercial centre of Silesia, has sugar and cotton factories. Stettin, at the mouth of the Oder and at the head of the Stettiner Haff, is the seaport of Berlin. The largest vessels, however, stop at Swinemünde, on the Baltic.

Danzig (now a free city), at the mouth of the Vistula, and Königsberg, at the mouth of the Pregel, are the chief ports of West and East Prussia. Rostock, on the Warnow, and Kiel are also important Baltic ports.

Hamburg, together with its outports, Altona and Cuxhaven, is the most important port, not merely in Germany but in continental Europe. The fine estuary of the Elbe permits great sea-going vessels to reach the city. Hamburg has a magnificent hinterland in the productive central portion of the German plain and in the industrial region of Saxony, and even in upper Silesia, and is the outlet for two-thirds of North Germany. Bremen, at the head of the Weser estuary, is one of the principal cotton markets on the Continent, but does not yet possess water-communication with such an extensive hinterland; though the projected great canal to join the Elbe to the Rhine will give it a greater share of the eastern traffic. The extensive system of German waterways, both natural and artificial, is an important factor in the commercial and

industrial development of the country. The government is fully alive to the value of cheap transport, and has already expended large sums of money in improving and constructing waterways. This is rendered less difficult by the fact that most of the German railways are State-owned.

The Rhine is navigable to a point 27 miles above Mannheim for boats up to 2000 tonnage, and to Basel for barges of 1000 tons. The Saar has been canalised, and provides an outlet for an important coal and iron district. The Dortmund-Ems Canal traverses the Westphalian mineral region; coal supplies 75 per cent. of the down-stream traffic, and about half the up stream freights consist of imported ore. The transport facilities of this region have been further extended by continuing the canal from Herne to join the Rhine below Ruhrtort. From near Riesenbeck, on the Dortmund-Ems Canal, a waterway has been built to the Weser and Hannover, thus providing an east-to-west route. On the Ems, Weser, and Elbe the 600-ton barge is typical of the largest class. The Weser is navigable for small barges as far as Cassel, on its tributary the Fulda; and there is a deep waterway between Bremen and Hameln. The Elbe is navigable beyond the Saxony frontier, and carries much of the traffic of Czechoslovakia. The Elbe-Trave Canal, from Lauenberg to the seaboard, passes through Lübeck, and has greatly increased the trade of that port. The peninsula of Schleswig-Holstein is cut by the Kiel Canal, which joins Holtenau, near Kiel, on the Baltic, to Brunsbüttel, near the mouth of the Elbe. The Oder is navigable as far as Ratibor, and connects the maritime port of Stettin with the Silesian coalfields.

Berlin and its neighbourhood are connected with the Oder by the Finow and the Oder-Spree canals, and also with the Elbe by the Teltow and Havel canals. From Königsberg and Danzig there is a water-route, through the forest and agricultural districts of the Vistula, to Kustrin, on the Oder.

German ports are favourably situated for oversea trade with Scandinavia, the British Islands, and the seaboard countries of the world. The produce of the Rhine, however, has either to be shipped from the ports of Belgium and the Netherlands, especially Antwerp, Rotterdam, and Amsterdam, or else to be sent by a roundabout way to Bremen and Hamburg, the two German ports on the North Sea. In spite of this disadvantage, which will eventually be removed by building a ship-canal from the Rhine to the German seaboard, the German oceanic trade has increased enormously.

Foreign Trade.—Its central position in the heart of Europe gives Germany a great advantage in trading with countries bordering its frontier, and even beyond, as the railways, except in Russia, are of one gauge, and goods can be transported without break of bulk. An illustration of the importance of this is afforded by the growth of German trade with Italy since the opening of the St Gotthard tunnel permitted direct railway communication. The upper navigable waters of the Danube, the international waterway from Eastern Europe, are within the empire, and canals join the Rhine to the Rhone and to the Marne in the west.

Manufactured goods of all kinds form the chief exports and also the chief imports. The most im-

portant are textiles, base metals and metal manufactures, chemicals, machinery, and leather goods, of which more are exported than imported, and food-substances, raw materials, precious metals, and manufactures, of which more are imported than exported. Among the imported food-stuffs, cacao has assumed a prominent place within recent years, the consumption per head of the population and the imports, mainly from West Africa, having largely increased. Although much German agricultural produce is exported, between three and four times as much is imported. Sugar is one of the most important commodities exported to the United Kingdom; and cotton, woollen, and wood manufactures, iron and steel goods, cereals, glass, and eggs rank high. The most important articles imported from the United Kingdom are woollen and cotton goods, machinery, coal, iron, yarns, and herrings.

The trade with the United States is now the most valuable; second in importance is the trade with the United Kingdom. Next in order is the trade with Russia, Czechoslovakia, Poland, Austria, Hungary, France, Belgium, Switzerland, Italy, and the Netherlands. Imports from Central and South America, the West Indies, and British India are more valuable than the exports.

Danzig.—Under the Treaty of Versailles, the city of Danzig, along with the surrounding area of the Vistula delta, became a Free City State. The population is predominantly German, the trade principally Polish. Grain, sugar, and timber are the staple exports. As the outlet of the Vistula basin, Danzig is within the Polish customs union; railways link it with Warsaw, Lodz, and Pozen.

Poland.—The resurrected land of the Poles is a republic lying between Germany and Soviet Russia, and stretching southwards from the Baltic Sea, East Prussia, and Lithuania, to Czechoslovakia.

and Romania. The country is the basin of the Vistula, and thus essentially agricultural. Rye, oats, barley, and wheat are the principal cereals; sugar-beet, hemp, hops, and tobacco are cultivated. Coniferous forests in the north-west, and minerals in the south-west, add to its wealth. Coal is extensively mined in Silesia, a region formerly German. In Galicia are extensive valuable petroleum deposits, in the neighbourhood of Tustanowice and Dzohobycz. Wieliczka, near Cracow, has long been famous for its salt-mines, which form a great underground town. Iron and zinc ores are of minor importance. The principal industries are the cotton factories of Lodz; various other manufactures include sugar and paper at Warsaw (Warszawa), the present, and Cracow (Krakow), the ancient, capital, both on the Vistula. There are blast furnaces and zinc works at Königshütte on the Silesian coalfield. Railways traverse the republic, and the Vistula has steam navigation, in summer, below Warsaw.

CHAPTER XXI.

THE LOW COUNTRIES.

BELGIUM.

BELGIUM, like Germany, consists of a forested region in the south—the Ardennes—bordered by a northern plain. The temperature is equable, the rainfall moderate and uniform.

Products.—The Campine, or eastern part of the plain, is marshy and infertile, except where it has been reclaimed. Flanders, the western part of the plain, is fertile. In parts it lies below the level of the sea, which, as in Holland, has to be kept out by dikes. The land thus reclaimed forms moist, rich meadows. The plains of Flanders, Brabant, and Hainault are cultivated with cereals, pulses, flax, tobacco, hops, chicory, and sugar-beet. Sheep are fed on the grass-lands of the Ardennes. The horses of Belgium are famous.

Minerals and Manufactures.—Belgium is rich in minerals, more especially coal and iron. The coal-fields lie on the Meuse and Sambre, round Liége and Charleroi, and in the region west of Mons (the Borinage). East of Liége are large zinc-mines.

The chief manufactures of Belgium are machinery, textiles, chemicals, and glass. Flanders has long been one of the most important manufacturing districts of Europe, especially famous for its linens, which are partly made from locally-grown flax, and bleached in the waters of the Lys, which possess properties peculiarly suitable for that purpose. Courtrai and Ghent (Gand) manufacture cotton and woollen goods. Fine lace is made at Mechlin (Malines). In the east, wool is manufactured at Verviers. The metallurgical industries, of which the making of machinery is the most important, are carried on in the valley of the Meuse, especially round Liége, where the manufacture of glass is also of importance. The cement industry is important in the Hainault district.

Trade, Towns, and Routes.—The exports of Belgium are manufactured goods, iron, steel, machinery, textiles, sugar, chemicals, glass, and also coal and zinc. The imports are cereals, raw materials for manufacture, minerals, chemicals, coal, timber, oil-seeds, coffee, rubber, and manufactured goods.

The largest trade is with France, Germany, Britain, and the Netherlands, the exports and imports being comparable in value. The imports from the United States, on the other hand, far exceed the exports to that country.

A very large transport trade takes place across Belgium between Germany and countries overseas,

mainly through Verviers, Liége, and Antwerp (Anvers), the chief port on the estuary of the Schelde. Antwerp has a large trade with the North Sea ports, and with New York, South America, and West Africa, to which vessels run regularly. It is connected by canal and rail with the industrial region of Belgium, for which it is the outlet. Brussels, Bruges (outport, Zeebrugge, with train-ferry to Harwich), and Ghent are important inland harbours. With the completion of the Willebroeck Canal, the port of Brussels has been opened to small sea-going vessels. A railway runs south from Antwerp through Brussels and Namur to Luxemburg and Alsace-Lorraine, Switzerland, and Italy by the St Gotthard tunnel. From Brussels a line passes south-westward by Mons to Paris, westward to Ostend (Ostende), the packet-station for Dover, through Bruges, Ghent, and eastward by Liége and Köln (Cologne) for North Germany by lines across the plain, or for South Germany by the Rhine.

THE NETHERLANDS.

Configuration and Climate.—The Netherlands, or Holland, consists of the delta of the Rhine, together with the marshes between the Rhine and the Ems. Much of the country has been reclaimed from the sea by means of dikes and powerful pumps. This land, which is saturated with water, forms rich meadows known as *polders*. Canals intersect the land in all directions, and serve to drain the water-logged soil, and as means of communication. So important are the dikes and canals for the very existence of Holland, that a special department of State is charged with the protection of the dikes and the regulation of the

canals. Reclamation is still going on, and a new province of over 500,000 acres is to be formed about 1933 by draining part of the shallow Zuider Zee, a great inland gulf running far into the heart of the country, at an estimated cost of over £24,000,000.

Plant and Animal Products.—The rich meadow-lands are admirably suited for grazing, and cattle-raising and dairy-farming are the chief occupations. The principal agricultural crops are cereals, chiefly rye and oats, potatoes, root-crops, beet, chicory, flax, and tobacco. The cultivation of bulbs has long been a notable occupation. The North Sea fisheries, and more particularly the herring-fisheries, occupy numerous Dutch trawlers and fishing-boats; while net-making is an old and important industry. Oysters are cultivated round the coast. Minerals are unimportant with the exception of clay, which is made into earthenware (at Delft), bricks, tiles, and glass. Within recent years coal has been successfully worked in the Limburg district and in the extreme south-east of the country. Hitherto peat has always been the national fuel of Holland, and the removal of the peat in several districts, formerly barren, has exposed a layer of fertile soil which has proved suitable for the cultivation of wheat and potatoes.

Manufactures.—Holland is deficient in coal, iron, and other minerals, and also in water-power. This has militated against the development of metallurgical and textile industries, but with the aid of imported coal some textile manufactures are carried on, mainly in the province of Overijssel and North Brabant. Considerable use is made of wind-power. The manufacture of margarine has become of great import-

ance. Cacao, beer, gin, and various liqueurs are also made.

Trade, Towns, and Routes.—Much of the trade of Holland is an entrepôt trade. Cereals, flour, iron, copper, steel, and textiles figure as valuable items both in the list of imports and in the list of exports. They are not of Dutch origin, and are imported only to be re-exported. Among exports of Dutch origin, home or colonial, the principal are rice, sugar, margarine, butter, cheese, vegetables, and coffee. The chief imports for home use are wool, coal, rice, coffee, sugar, and hides.

Most of the trade of Holland is with Germany (for which it serves both as an outlet and an inlet through the ports of Rotterdam and Amsterdam), the British Isles, Belgium, the United States, and the Dutch East Indies, all of which are important customers. Canals and railways connect all parts of Holland. The Rhine is the most important waterway. Rotterdam, on the right bank of its distributary the Lek, is the chief port. Amsterdam, the other great port of Holland, is joined to the North Sea by two canals, one running due west to Ijmuiden, the other northward to the Helder. Important passenger routes run from west to east, one from Flushing (Vlissingen) to Venlo, on the frontier, opposite to the Ruhr valley, and the other from the Hook of Holland (Hoek van Holland) to Rotterdam, whence lines diverge in all directions.

CHAPTER XXII.

THE SCANDINAVIAN COUNTRIES.

DENMARK.

DENMARK consists of the peninsula of Jutland and of the islands between it and Sweden, of which the largest are Fyen, Zealand (Sjælland), Falster, Laaland, and the more distant Bornholm. Except in the last named, the land is low, gently undulating, and covered with meadows. One-fifth of the land is covered with peat-mosses, and one-third is under cultivation, mainly on the Baltic islands. Oats, barley, rye, beet, and potatoes are the chief crops. Dairy, pig, and poultry farming is the most important occupation, and food substances provide about 80 per cent. of the exports in the form of pork, butter, eggs, and lard. The fisheries are of increasing importance. Cereals, provisions, textiles, hardware, colonial produce, and coal are the principal imports. Britain is the best customer of Denmark; next come Germany, United States, and Sweden. Germany is the most important source of the imports, the United Kingdom the greatest buying market.

Denmark has progressed greatly since the organisation of a thorough system of technical education, and of co-operation in collecting and disposing of the produce of the many dairy-farms. It also affords an excellent example of what may be accomplished in a country with very small farms whose occupiers have security of tenure.

Copenhagen (Kjøbenhavn), the capital, is the chief

port on the Sound, by which most vessels enter the Baltic. Its harbour is free, and it does a large entrepôt trade. Aarhuus exports much of the produce of Jutland. Routes pass westward from Copenhagen to Korsör for Kiel, to Esbjerg in Jutland for Harwich, and southward to Gjedser for Warnemünde near Rostock in Prussia. On the shorter ferries whole trains are carried by the steamers.

NORWAY.

Configuration and Climate.—Norway consists of the western slope of the lofty Scandinavian plateau, lying between 58° and 71° N. Its western or seaboard edge is deeply cut by innumerable fiords, fringed by islands, forming a breakwater within which calm waters are found. The lower slopes of the plateau are covered with pine-forests. The agricultural land lies in the south-east, the best round Kristiania and Mjösen. Most of the towns are built on the coast, either of the mainland or of the islands. The climate is mild and wet on the south coasts, but cold on the plateaus and in the north.

Productions, Occupations, and Towns.—The wealth of Norway consists in its seas and its forests. On the coast, which is the most thickly populated part of the country, every family is dependent, more or less, upon the fishing or shipping industry. Crews are sent to the North Sea fisheries, where cod, mackerel, herring, and bristlings are caught, and to the seal and whale fisheries, not only in north polar waters, but also off the coast of Africa and of South Georgia. Fish-curing is an important industry, and the tinning of provisions, especially spring herring, is steadily de-

veloping, chiefly in Stavanger and Haugesund. The forests supply turpentine and timber (much of the latter being converted into pulp for the manufacture of paper), and matches. Printing and packing papers are the leading kinds of paper made, especially at Drammen and Skien. Shipbuilding is carried on all round the coast, the chief yards being at Kristiania, Bergen, and Trondhjem; the building of motor-boats for use in the fishing industry is growing in importance. The Norwegians are among the great shippers of the world. Considerable developments are taking place in the mining industry, largely owing to the introduction of electrical smelting. The iron ores of north Norway are treated at Sydvaranger and Salanger; iron deposits also occur near Tromsö Sound, and in the south at Kragero and Arendal. There are extensive iron-foundries and smelting-works at Kristiania, Bergen, and Stavanger. There are important copper-smelting works at Sulitjelma, Mel-dalen, and Elmore. Silver is found at Kongsberg, and nickel near Haugesund. Saltpetre is worked at Rukan. The abundant water-supply of Norway is proving a very valuable industrial asset. At Odda, on the Hardanger Fiord, water-power is being utilised in the manufacture of calcium cynamide, for which Norway possesses abundant supplies of limestone.

Kristiania, the capital and chief port, is in the centre of the agricultural and manufacturing district of the south-east. Several condensed-milk factories are situated in this area, and large quantities of butter are shipped from Kristiania, Bergen, and Trondhjem.

Trade and Routes.—Timber and wooden goods, paper,
Cop. Geog. ?

fish and fish products, tinned provisions, condensed milk, butter, and ice are the chief exports. Rye and rye-flour (from Germany and Russia) and coal (from the United Kingdom) are by far the most important imports; then come machinery, especially electrical machines, barley, sugar, coffee, and flour. The United Kingdom is still the best customer, but in recent years Germany has furnished an increasing proportion of the imports.

Railways are not much developed. A line runs from Kristiania to Bergen, and another, by the copper-mining district of Röros, to Trondhjem. From Kristiania, Trondhjem, and Narvik railways pass to Sweden.

SWEDEN.

Configuration and Climate.—Sweden occupies the eastern slope of the Scandinavian plateau. It differs from its western neighbour in many respects. The proportion of plain is much larger; the extremes of temperature are more marked; the rainfall is low, and comes chiefly in summer.

Products and Manufactures.—The southern plains are cultivated with oats, barley, wheat, potatoes, and sugar-beet. Dairy-farming is increasing in importance. Two-fifths of the surface is forest, which is utilised in the same way as in Norway. Minerals are abundant, more particularly very pure iron ores, copper (Falun), lead and silver (Sala), and zinc (Ammeberg). The iron-mines are in the extreme north, at Gellivara, and near Dannemora, to the north of Lake Mälar. The manufacture of steel and iron goods is the principal industry in the region between Lake Mälar and the Dal. Sugar and textiles are

manufactured at Stockholm, and textiles at Norrköping, and Göteborg. Sweden specialises in dairying, match-making, scientific and electrical machinery. Fishing is important round the skerry-bordered coast.

Trade, Towns, and Routes.—Timber, wood pulp, and paper account for one-half of the exports. Metals, machinery, minerals, live animals, and dairy produce rank next. Coal, metal goods and machinery, raw and manufactured textile materials, colonial produce, and cereals head the imports. The best customer of Sweden is the United Kingdom, which takes 30 per cent. of its exports, mainly in the form of timber and timber products. Germany, United States, and Denmark rank next. The imports are chiefly from Germany, the United States, and the United Kingdom, followed by Denmark.

The most important port is Göteborg (in German, Gothenburg), on the Göta. Stockholm, on Lake Mälar, the capital, ranks as the second. From Stockholm a railway runs north by Upsala, with a branch to Trondhjem in Norway, to Gellivara, whence it is continued to Narvik, in Norway, on the North Sea, which permits the exportation of iron ore all the year round. Lines run west to Kristiania and Göteborg, and south to Malmö and Karlskrona, through the manufacturing town of Norrköping. The routes to Germany are from Trelleborg to the island of Rügen, or from Malmö to Copenhagen and through Denmark (q.v.).

CHAPTER XXIII.

THE UNITED STATES OF AMERICA.

THE United States lie between 25° and 49° N.—that is, between the latitudes of the Canary Islands and the English Channel on the opposite side of the Atlantic, or of Argentina in South America. The area of the United States, excluding Alaska, is over 3,000,000 square miles, about that of the Australian Commonwealth, or a little less than the mainland of Europe. They are bounded on the east by the Atlantic, on the west by the Pacific, on the north by Canada, and on the south by Mexico and the gulf of that name.

Configuration.—Physically the United States consist of the Appalachian Highlands in the east, the Great Plains in the centre, and the lofty Western Mountains. The eastern Appalachian Highlands are fringed by a coastal plain, which is broadest in the south. In the north, where the region has been submerged, the drowned valleys form excellent harbours, such as Chesapeake Bay and the Delaware and Hudson estuaries. Transversely, the Appalachian Highlands are broken only by the Hudson valley, which leads by Lake Champlain to the St Lawrence, and by the Mohawk valley to the Great Lakes. These lakes form the northern boundary of the eastern part of the great Central Plains, and are a waterway into the heart of the country comparable to that formed by the Gulf of Mexico in the south. The great Central Plains stretch

across the continent from the Appalachians to the foot of the Western Mountains, rising gradually to the base of the easternmost range, the Rocky Mountains. The Mississippi flows almost due south across the centre of the plains, receiving mighty tributaries, the Ohio from the east, and the Missouri, Platte, Arkansas, and Red Rivers from the west. The western Cordilleras consist of a broad plateau, with numerous ranges rising above it, whose eastern parapet is formed by the Rocky Mountains, and western boundary by the Cascades and the Sierra Nevada. West of the latter is the Sacramento valley, bounded on the west by the Coast Range. The coast ranges follow the west coast throughout the United States territory, and are terminated in the north by the Strait of Juan de Fuca, which opens into Puget Sound, the drowned northern end of the valley between the Cascades and the coastal range, a continuation of the Sacramento valley in the south. Two rivers break through the coastal ranges—the Columbia in the north, and the Sacramento in the south.

Climate.—On the west coast the temperature is equable, but elsewhere it is one of extremes. The summer temperatures are specially high, but it must be remembered that the most northern part of the United States is nearer the equator than the most southern part of the British Isles. The warm summers rather than the cold winters determine the nature of the plants which can be cultivated. In the extreme south the inflowing winds bring summer rains, which fall over the whole of the Central Plains. Depressions pass over the plains in winter, drawing moist air from the Gulf of Mexico, and causing

winter rains. Thus, east of a line drawn from the west of the Gulf of Mexico to Lake Michigan, the precipitation is considerable at all seasons. California has a Mediterranean climate of dry summers and cool, moist winters.

Economic Divisions.—In the north the economic divisions are the same as in southern Canada. In the west the slopes of the Western Mountains are densely forested, but the arable plains of the Columbia and Sacramento Rivers are wider than those of British Columbia. On the Plains the ranching area is greater, owing to the extension eastward of the region of low rainfall. The forest belt extends along the borders of the Great Lakes, and is continued over the whole of the Eastern Highlands to the Atlantic coastal plain.

In the south the economic conditions are of an entirely different type. The Gulf coast lands produce rice and sugar-cane; from here cotton is grown to about the 36th parallel, most largely in Texas, Arkansas, and Mississippi. Maize, grown in every state except the most northern, is most important between the Ohio and the lower Missouri, and in eastern Nebraska and Kansas. Sugar-beet is extensively raised in a belt stretching along the July isotherm, 70° F. For export, tobacco is grown principally in Kentucky, Virginia, and North Carolina, and in the adjacent states. Wheat is cultivated most extensively between the Appalachians and 100° W., especially in North Dakota and Kansas, and in the Sacramento and Oregon valleys. In California the vine comes to perfection on the hill-slopes, particularly in the south, where all Mediterranean fruits are cultivated. In the drier states of the west,

irrigation is leading to a considerable development of agriculture.

Minerals.—The mineral regions described in southern Canada extend across the frontier into the United States. Gold is found in small quantities in the east, and is fairly abundant in the Western Mountains, especially in Colorado and California, and in Alaska. Silver is very important, and is mined in Colorado, Montana, Utah, and many other states. Mercury is obtained from New Almaden in California; copper from Montana, Arizona, and the north of Michigan; zinc from Kansas and Missouri. In addition to building stone and clay, the most useful minerals are oil, coal, and iron, all of which are found in large quantities. The oil regions in central and southern California, in Oklahoma, and in Texas, the joint petroleum output of which yields about 70 per cent. of the total output of the United States, and the development of cheap electric power from the streams of the Sierras, are compensating for the absence of coal in the southern Pacific states, and supply a surplus for export. The most important coalfield is in north-east Pennsylvania, where fine anthracite is mined. Coal, however, is very widely distributed all along the western margin of the Appalachians, round the lower Missouri, and between this region and the Ohio. Iron is most abundant in the States of Minnesota, Michigan, and Alabama. The bulk of the ore from the Lake Superior region is sent to the Lake Erie ports (Ashtabula, Cleveland, and Conneaut) to be smelted with coal and oil fuel from the eastern coalfields, especially at Pittsburg (Penn.) and at Cleveland (O.), the latter of which receives abundant limestone to act as a flux.

from neighbouring islands in Lake Erie. The ore from the Appalachian region, between the Delaware and the Gulf of Mexico, is smelted at Birmingham (Ala.), where coal and limestone are also found.

Manufactures.—The vast stores of coal, iron, and oil, and the abundant water-power, naturally led to great manufacturing activity as soon as population became sufficiently dense in the east to supply the necessary hands and markets. The United States is now the most important manufacturing country in the world, with an output twice that of the United Kingdom, most of it being consumed at home.

The manufactures of the United States may be classified under four heads: those concerned with the elaboration of forest products; those concerned with the manufacture of pastoral and agricultural produce; the manufacture of textiles and articles of clothing; and the metallurgical industries, including transport materials.

Lumbering is an important industry round all the Great Lakes, but the chief supplies of timber are now obtained from the north-western mountains of Oregon and Washington, and from the southern states, where the resources of hardwood are of great economic value. Where water-power is available, saw-milling, coopering, and the manufacture of wood-pulp, paper, and furniture spring up at suitable centres in the forest regions. Most of the towns of the Great Lakes are thus engaged, especially Detroit.

The chief flour-milling centre is Minneapolis, situated near the Falls of St Anthony, and with easy access to the great wheat-lands of the Dakotas and Minnesota. Other important milling centres are New

York, Buffalo, Milwaukee, and Kansas City. Maize, used as a food for man and beast, is also made into starch and glucose, which is fermented and distilled. The ranching area has given rise to an enormous trade in preserved meat. Cattle from the western ranches and hogs fattened on maize on the eastern plains are brought to the meat-packing cities to be slaughtered and canned. Chicago, Kansas, and Omaha are the largest centres for cattle-slaughtering, and Chicago is also the centre of the pork-packing trade. It is an interesting fact, economically, that the centres of this trade have moved far to the west within the last forty years, owing to the rapid extension of settlement and agriculture west of the Mississippi, and the consequent pushing westward of ranching. In the seventies Cincinnati, often called Porkopolis, occupied the same position in the meat-packing trade as Chicago does to-day. Fruit-canning is now an important industry, especially in California. Tobacco is manufactured in Virginia, West Virginia, and North Carolina; Louisville, in Kentucky, and Richmond, Virginia, being among the chief tobacco markets of the world. It is also manufactured at St Louis. West Indian sugar is refined at Philadelphia. The output of home-grown cane-sugar is diminishing, while that of beet-sugar has been doubled during the second decade of the century.

The textile industries have developed in the long-settled and thickly peopled north-eastern states, which possess a moist climate, water-power, and easy access to the coalfields of the north and the cotton plantations of the south and to a large market. Manchester (New Hampshire), Lowell and Lawrence (Mass.), all

on the Merrimac; New Bedford and Fall River, the most important centre, in southern Massachusetts; and Providence, in Rhode Island, are famous for cottons. A chain of towns, engaged in textile and other manufactures, has grown up along the Appalachian 'fall-line,' where the rivers form rapids and falls in passing from the highlands to the coastal plain. Since the opening of the century remarkable developments have taken place in the manufacture of local cotton in the cotton-growing states, especially in North and South Carolina, Georgia, and Alabama, with their good supply of labour and abundant store of power derived from the adjoining coalfields or from the streams. The mills of the south-eastern states now use more raw cotton than New England, though they possess fewer spindles. Cotton-seed crushing has become an important industry in recent years, and by utilising the by-products has made a very substantial addition to the value of the cotton-crop. Woollen manufactures are growing in importance, and the demand for woollen goods is great owing to the cold winters. The chief centre is Philadelphia (Pa.), but woollen goods are also made at Lawrence and Lowell in Massachusetts, Providence (R.I.), New York City, and other towns of the coastal states from Pennsylvania northward. The woollens are manufactured into ready-made clothes at New York, Philadelphia, Chicago, Boston, and all the great cities. An extensive silk industry is carried on in New Jersey (Paterson), Connecticut, Pennsylvania, and New York State, the raw material being imported, chiefly from Japan, although the climatic conditions of the southern states are well suited to the cultivation of the mulberry. Pennsyl-

vania is the largest producer of leather in the United States; many New England towns are noted for their machine-made boots and shoes (Lynn, Mass.), and for hardware of all kinds (Hartford, Conn.). Glass manufacture is an important industry in the Pittsburg district.

The metallurgical industries are carried on in the coal and iron regions. The great iron-manufacturing centres are Pittsburg, in eastern Pennsylvania; Chicago, in Illinois; and Birmingham, in Alabama. The making of machinery is carried on in all the great cities, especially Philadelphia, Chicago, New York, Pittsburg, and Gary. Chicago, Buffalo, Detroit, and Worcester (Mass.) make railway plant. Detroit is the largest centre of the motor-car industry. Philadelphia is noted for its locomotives, and here and at San Francisco steel shipbuilding is developing; the naval dockyards are situated at Norfolk (Va.).

The United States is only at the beginning of its career as a manufacturing nation. Its enormous command of raw material, of fuels, such as coal and oil, and of water-power, and its great and growing population, fit it to take the leading place in the future. The industrial development of the United States, however, should not be compared with that of one of the states of Europe, but with the whole. The great advantage of the American United States is that the highest intelligence is brought into its industrial life, which is unhampered by the undue conservatism of the Old World. New and improved methods are promptly adopted; machinery and processes are never allowed to become antiquated; and though labour is more costly per head, it is more intelligent and

energetic, and consequently, in the long-run, cheaper, than in the older manufacturing countries of the world, although it may not be so persistent nor so thorough.

Internal Communication.—There are over 25,000 miles of navigable waterways in the United States, the most important of which are the Great Lakes and the Mississippi. Nearly 14,000 miles of river are navigable in the Mississippi basin, but the tonnage transported on the river and its tributaries has greatly declined. Only the lower courses of the Appalachian rivers across the coastal plain are important, except in the case of the Hudson, which crosses the Appalachian barrier from north to south, is navigable for ocean steamers for 100 miles, and carries much traffic. On the Pacific coast the Columbia is navigable for 500 miles, and the other large rivers for from 100 to 150 miles.

The traffic on the Great Lakes is vast, and continually increasing. The tonnage passing through the Soo Canal, between Huron and Superior, was, in 1919, nearly 70,000,000 tons, over four times that of the Suez Canal. Of this traffic 50 per cent. consists of iron ore, chiefly from the ports of Duluth, Two Harbours, and Superior. The remainder of the traffic consists chiefly of grain and flour, lumber, and coal. Duluth, Superior, Chicago, and Milwaukee are the leading wheat ports; and the first-named is also the chief timber port. Coal is sent westward from the Lake Erie ports, as well as the textiles, machinery, and other manufactured goods of the eastern states. The Erie Canal avoids the Niagara Falls, and connects Buffalo on Lake Erie with the Hudson by the Mohawk valley.

The coasting traffic is also very great, and is carried on only by vessels flying the United States flag.

The railway system of the United States is very highly developed, especially in the east and north-east of the central plain, radiating from Boston, New York, Philadelphia, Buffalo, Cincinnati, Chicago, St Louis, and many other centres, with ramifications too complex for summary here. From Chicago, the greatest railway and transport centre in the world, four lines cross the continent. The first in order of construction was the Union Pacific, which goes by Omaha and the Great Salt Lake to San Francisco, with a branch line which runs north-west to Portland in Oregon. The Great Northern runs parallel to the Canadian frontier, at no great distance south of it, to Tacoma on Puget Sound. The North Pacific also runs parallel, but farther south, by Bismarck in Missouri, and Helena in Montana, to Portland. The Topeka and Santa Fé line goes by New Mexico and Arizona to southern California. A line connects San Francisco with Portland, Tacoma, and other Pacific cities. A fifth trans-continental line, the Southern Pacific, starts from San Francisco, and skirts the Mexican frontier and Gulf to New Orleans, from which radiates a network of lines to every part, through Cairo and St Louis to Chicago, through Louisville to Cleveland, and through Atlanta to New York and Boston.

Internal and Foreign Trade.—Until the closing decade of the nineteenth century, the exports of the United States were mainly the produce of its forests, farms, plantations, and ranches, swollen at times by considerable quantities of gold and silver. These are still the most important, but no longer the sole exports.

Raw cotton, despite the ravages of the boll-weevil, ranks first in value, followed by cereals, especially wheat and maize. Tinned meats and other products of the ranches, and cheese from the east, where dairy-farming is largely carried on, live-stock, leather, hides, timber, minerals, and oils are all important.

The closing years of the nineteenth century were marked by a remarkable development of the export trade in manufactured articles, more especially iron. In 1885 the exports of iron and steel were worth only half as much as the imports. In 1890 they had risen in value to five-eighths; in 1895 they had reached half as much again as the imports, and in 1922 the extraordinary figure of six and a half times as much. Iron and steel goods now rank third in value on the list of American exports. The imports are manufactured goods, more particularly textiles, sugar, coffee, silk, hides, rubber, and other raw materials. With the development of the last twenty years the imports have changed in character and relative value. Raw materials for manufacture amounted in 1921 to one-third the total value of the imports, as against one-fifth in 1891; the imports of manufactured articles show a slightly decreasing proportion during the same period.

The chief trade of the United States is with Europe, which takes 50 per cent. of the exports, and sends 30 per cent. of the imports. The leading customer is the United Kingdom, which takes one-quarter of the domestic exports of the States, while supplying about one-tenth of the imports. Germany is the next best customer, accounting for one-tenth of the exports from the United States, but sending a small part

of the imports. Within recent years there has been a remarkable development in the trade with Canada; in 1922 the value of the exports to Canada was nearly twice the value in 1912, and the imports from Canada about three times. France, the Low Countries, and Italy are next on the list of United States customers. In the Mexican trade of the United States the imports and exports nearly balance; while from the South American states, with the very important exception of Argentina, the imports considerably exceed the exports, particularly in the case of Brazil, from which much cotton and coffee are obtained. The imports to the United States also exceed the exports from it in the case of India, China, Japan, and the East Indies. The exports to Australia, on the other hand, far exceed the imports in value, and are rapidly growing.

The United States are now in regular communication with the United Kingdom, Germany, the Low Countries, France, and Italy, and no effort is spared to render the trans-Atlantic service as rapid as possible. New York is the chief terminus of the cross-Atlantic traffic, but regular lines of steamers also run to and from Portland (Maine), Boston, Philadelphia, Baltimore, Savannah and other South Atlantic ports, New Orleans, Galveston, and other Gulf ports.

A considerable change has taken place in the relative importance of these cities as exporting centres. Fifty years ago New York had 46 per cent. of this trade, and New Orleans 15 per cent. Now New York has only 25 per cent., while Boston, Baltimore, and Philadelphia have profited; New Orleans has now only 8½ per cent., while Galveston has steadily increased in importance with the development of Texas, and has

now $5\frac{1}{2}$ per cent. of the export trade. Boston, Philadelphia, and Baltimore have from 3 to 4 per cent., the two former ports having grown with the increased export of manufactured goods, while Philadelphia and Baltimore are nearer the tobacco and maize growing districts than New York, although access is not so easy to the central plain.

Judged by the amount of tonnage entered and cleared, the principal seaports, in order of importance, are New York, Philadelphia, Boston, New Orleans, Baltimore, Puget Sound, San Francisco, Galveston, Newport News, and Mobile. Boston suffers from difficult communication with its hinterland; New Orleans has benefited by the opening of the Panamá Canal; San Francisco is disadvantageously situated on a short peninsula.

In 1901 the first through steamer sailed for Chicago, which is now practically an ocean port, from Manchester, which is also naturally an inland town.

The trans-Pacific service is less important at present than the trans-Atlantic, but regular lines of steamers sail from San Francisco to Japan, China, the Philippines, and Australasia. The export trade of San Francisco, however, is still chiefly with Europe, and a relatively large proportion of the trade with Britain is carried on by sailing-ships. The opening of the Panamá Canal has given a great impetus to the steamship trade between the Atlantic and Gulf ports and those on the Pacific seaboard.

APPENDIX.

TRADE STATISTICS, MONEY, WEIGHTS, AND MEASURES.

NOTES.

In the following tables statistics are generally given for the pre-war year 1913 and the post-war year 1921. The figures for these years are not strictly comparable, owing to currency depreciations, economic and industrial unrest, territorial changes, and the working of other factors. On the other hand, they give some indication of the stability of trade conditions.

Average quinquennial figures cannot yet be given for any of the countries engaged in the late war, and for the sake of uniformity the years selected have been introduced practically throughout the tables.

The establishment of new states and the territorial aggrandisement or reduction of some old states render any pre-war figures in such cases of small value to the young geographer. Such countries are marked with an asterisk.

Owing to changes in methods of classifying commodities it has not always been possible to give parallel figures of value for the pre-war and post-war years. In such cases the post-war classification has been adopted, and the pre-war figures omitted.

I.—BRITISH POSSESSIONS.

AFRICA.

UNION OF SOUTH AFRICA.

TOTAL TRADE OF PROVINCES WITH UNITED KINGDOM.

	Imports.		Exports.	
	1913.	1922.	1913.	1922.
Cape Province	£1,000. 11,766	£1,000. 12,125	£1,000. 9,381	£1,000. 11,309
Natal	5,442	6,361	2,724	4,785
Orange Free State	603	563	—	—
Transvaal	6,235	6,728	196	53

UNION OF SOUTH AFRICA—*Continued.*

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000. 41,829	£1,000. 57,800	Total . . .	£1,000. 66,569	£1,000. 65,819
Food and Drink	7,584	5,398	Gold.. . .	37,590	34,454
Machinery . . .	2,843	5,071	Wool . . .	5,719	8,237
Hardware and Cutlery . . .	1,704	3,328	Coal . . .	1,390	5,150
Cotton Piece Goods . . .	1,755	3,201	Maize . . .	65	2,296
Apparel . . .	2,709	3,005	Sugar . . .	3	2,070
Oils . . .	844	2,813	Diamonds . . .	12,017	1,355
Cotton Manufactures . . .	1,456	2,641	Hides and Skins . . .	2,018	1,227
Electric Wire and Fittings . . .	514	2,220	Mohair . . .	876	584
Woollen Manufactures . . .	814	1,613	Bark, Wattle . . .	309	570
Stationery and Books . . .	790	1,458	Ostrich Feathers . . .	2,954	462
Iron and Steel . . .	946	1,438	Fish . . .	107	263
Wood and Timber . . .	981	1,299	Butter and Substitutes . . .	3	257
Vehicles, Motor, of all Sorts . . .	1,360	1,184	Blasting Com-pounds . . .	37	176
Drugs and Chemicals . . .	965	1,085	Meats . . .	6	173
Implements of all Kinds . . .	407	1,005	Wines . . .	17	94
Haberdashery . . .	1,320	933			-

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom	£1,000. 23,746	£1,000. 33,830	£1,000. 59,026	£1,000. 46,630
Other Parts of British Commonwealth	5,013	6,467	2,034	6,691
Germany	3,403	1,162	2,142	2,418
United States	3,668	8,327	536	1,498
Belgium	578	586	698	1,077
France	599	796	197	1,027

UNION OF SOUTH AFRICA—*Continued.*

PROPORTION PER CENT. TO TOTAL VALUE OF TRADE BY CLASSES.

Imports.	1913.	1921.	Exports.	1913.	1921.
Animals, Living .	0·66	0·52	Animals, Living .	0·06	0·08
Agriculture (Articles for Use in) .	1·82	2·24 ¹	Agricultural and Pastoral Produce	18·39	27·20
Food and Drink .	18·14	9·34	Products of Mines .	77·90	62·67
Raw Materials for Manufacture .	9·82	7·78	Other Articles .	0·64	1·65
Manufactured Articles .	69·28	79·21	Exports to Northern and Southern Rhodesia . .	0·82	1·69
Imports from Southern and Northern Rhodesia . .	0·28	0·91	Total South African Produce . .	97·81	93·27
	100·00	100·00	Imports re-Exported	2·19	6·73

¹ Including Agricultural Machinery.

Money.—British.

Weights and Measures.— British or metric (optional). Old Dutch measures still in use. Liquid measure: 1 leaguer=128 imperial gallons. Capacity: 1 muid=3 bushels. 1 morgen=2·1 acres; 1000 Cape lineal feet=1033 British imperial feet.

NYASALAND PROTECTORATE.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . .	£1,000. 268	£1,000. 638	Total . .	£1,000. 200	£1,000. 416
Manufactured Articles . .	148	441	Tobacco . .	94	297
Provisions . .	24	69	Cotton . .	65	67
Raw Materials . .	2	35	Tea . .	2	3

NYASALAND PROTECTORATE—*Continued.*

PERCENTAGE DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913-14.	1921-22.	1913-14.	1921-22.
United Kingdom	Per cent.	Per cent.	Per cent.	Per cent.
. . . .	71·0	55·2	91·4	99·3
British Possessions : : :	7·7	29·5	1·7	—
Foreign Countries	21·3	24·3	6·9	—

KENYA COLONY AND PROTECTORATE.

Imports.	1912-13.	1920-21.	Exports.	1912-13.	1920-21.
Total . . .	£1,000. 1,808	£1,000. 6,912	Total . . .	£1,000. 1,203	£1,000. 4,699
Cotton Textiles	522	1,353	Cotton, raw . .	12	3,149
Machinery and			Coffee . .	11	575
Parts thereof .	81	622	Grain and Oil		
Vehicles and			Seeds . .	147	276
Parts thereof .	58	468	Fibre . .	8	206
Building Materi-			Hides and Skins	88	149
als . . .	124	378	Carbonate of		
			Soda . .	—	107

¹ Including Uganda.

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1912-13.	1920-21.	1912-13.	1920-21.
United Kingdom	£1,000. 907	£1,000. 3,516	£1,000. 686	£1,000. 2,957
British Empire	433	1,824	118	1,498
United States	184	578	96	76

Money.—Currency is based on shilling (20 = £1).

UGANDA PROTECTORATE.

Imports.	1913-14.	1921.	Exports.	1913-14.	1921.
Total . .	£1,000. 1,021	£1,000. 1	Total . .	£1,000. 607	£1,000. 1,540
Yarns and Tex- tiles . .	295		Cotton . .	331	1,281
Provisions, in- cluding Wines, Spirits, and Tobacco . .			Coffee . .	23	94
Vehicles, Motors, and Bicycles .	88		Ivory . .	24	47
Agricultural Im- plements and Machinery . .	55		Oil Seeds . .	—	41
Hardware . .	47		Chillies . .	—	30
	31		Hides and Skins	82	26
			Rubber . .	—	4

¹ Import figures merged in those of Kenya Colony.

COLONY AND PROTECTORATE OF NIGERIA.¹

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . .	£1,000. 7,202	£1,000. 10,769	Total . .	£1,000. 7,352	£1,000. 8,028
Cotton Piece Goods . .	1,702	2,441	Palm Kernels .	3,110	2,832
Coopers' Stores.	—	199	Palm Oil .	1,854	1,656

¹ The Colony and Protectorate of Southern Nigeria (formed 1906) was amalgamated with the Protectorate of Northern Nigeria to form the Colony and Protectorate of Nigeria (in 1914). The Customs Departments of Northern and Southern Nigeria were amalgamated on January 1, 1913.

COLONY AND PROTECTORATE OF NIGERIA—*Continued.*

PERCENTAGE DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

		Imports. 1921.	Exports. 1921.
United Kingdom		80	77
United States		6	7
Germany		3	5

Money, Weights, and Measures.—British.

GAMBIA.

Imports.	1918.	1921.	Exports.	1918.	1921.
Total . .	£1,000. 1,091	£1,000. 924	Total . .	£1,000. 867	£1,000. 703
Kola Nuts .	91	142	Ground Nuts .	622	699
Cotton Goods .	202	114	Palm Kernels .	9	4
Rice . .	63	56			
Tobacco . .	15	22			
Hardware . .	27	21			

Money, Weights, and Measures.—British. A special silver coinage (2s., 1s., 6d., and 3d.) for West Africa was introduced in 1913, and an alloy coinage of similar denominations in 1920.

GOLD COAST.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . .	£1,000. 4,952	£1,000. 7,661	Total . .	£1,000. 5,427	£1,000. 6,942
Cotton Goods .	726	942	Cacao . .	2,489	4,764
Provisions .	240	317	Gold and Gold Dust . .	1,626	855
Carriages(Motor Cars, &c.) .	53	265	Kola Nuts . .	145	464
Machinery .	191	213	Lumber . .	368	206
Building Materials .	96	212	Palm Kernels . .	159	31
Oil (Kerosene) and Liquid Fuel . .	38	138	Manganese . .	—	12
Apparel . .	92	100	Palm Oil . .	66	8
Bags and Sacks	—	73			

PERCENTAGE DISTRIBUTION OF TRADE WITH OTHER COUNTRIES

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom	Per cent. 70·0	Per cent. 76·1	Per cent. 64·8	Per cent. 46·2
British West Africa	5·5	1·7	7·4	7·0
Germany	7·9	1·2	16·6	15·6
United States	5·1	12·6	1·9	14·9

Money.—British currency. American, French, and Spanish gold coins are also used at fixed values.

SIERRA LEONE.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000. 1,750	£1,000. 1,770	Total . . .	£1,000. 1,731	£1,000. 1,625
Cotton Goods .	425	359	Palm Kernels .	921	685
Coal . . .	49	153	Kola Nuts .	328	314
Tobacco . . .	75	113	Piassava .	--	13
Spirits . . .	92	37	Ginger .	--	13
Oil (Kerosene)	—	35	Palm Oil .	57	8
Specie . . .	312	193	Specie .	241	313

PERCENTAGE DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom	Per cent. 65·1	Per cent. 69·2	Per cent. 13·3	Per cent. 64·8
British West African Possessions	—	—	—	13·4
United States	—	11·5	—	12·7

* TANGANYIKA TERRITORY.

Imports.	1921.	Exports.	1921.
Total	£1,000. 1,426	Total	£1,000. 1,247
Cotton Piece Goods .	588	Sisal	238
Foodstuffs	129	Grain	183
Kerosene	49	Ground Nuts	141
Machinery	38	Coffee	138
Building Materials	37	Cotton	119
Spirits	36	Copra	100
Iron and Steel Manufactures	34	Ghee	32
Tobacco	27	Sim-Sim	29
Coal	25		

MAURITIUS.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000, 2,467	£1,000. 8,474	Total . . .	£1,000. 2,241	£1,000. 10,527
Foods stuffs, Drink, and Tobacco . .	140 ¹	1,997	Sugar . . .	2,047	10,306
Manufactured Articles . .	—	4,177	Aloe Fibre . .	57	7
Machinery and Implements . .	24 ²	800	Coco-nut Oil . .	4	1

¹ Cereals, Grain, &c.² Machinery.

TRADE WITH UNITED KINGDOM.

	1913.	1921.
Imports	£1,000. 815	£1,000. 2,704
Exports	397	9,002

Money.—All accounts are kept in Indian rupees, of which 15=£1.
Weights and Measures.—Metric.

ZANZIBAR.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . .	£1,000. 1,103	Rs. 1,000. 32,233	Total . .	£1,000. 1,049	Rs. 1,000. 32,464
Piece Goods .	191	6,777	Cloves and Clove Stems . .	413	12,252
Rice and Grain .	214	4,154	Copra . .	217	5,479
Wax . . .	—	3,630	Piece Goods .	85	5,123
Petrol and Petroleum	16	1,700	Petrol and Pet- roleum . .	20	1,294
Copra . . .	46	1,698	Rice and Grain .	29	1,020
Sugar . . .	—	1,286	Ivory . . .	40	881
Ivory . . .	34	802	Soap . . .	—	544
Cotton, raw . .	—	678	Cotton, raw . .	—	437
Flour . . .	—	620			

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
Tanganyika Territory . . .	£1,000. 96	Rs. 1,000. 5,925	£1,000. 129	Rs. 1,000. 6,627
India and Burma	450	10,487	173	6,330
United Kingdom	157	4,802	109	5,460
France	7	164	225	3,413
Kenya Colony	101	2,701	118	2,695
United States	29	858	48	1,814

Money.—The Indian rupee is current.

Weights.—1 frasla of cloves=35 lb. avordupois.

AMERICA.

CANADA.

Imports.	1913-14.	1920-21.	Exports.	1913-14.	1920-21.
	1,000 Dollars. 650,747	1,000 Dollars. 1,240,159		1,000 Dollars. 478,998	1,000 Dollars. 1,210,428
Total . . .			Total . . .		
Iron, Steel, and Manufactures	114,725	245,626	Wheat . . .	117,719	310,952
Coal . . .	46,875	111,298	Wood and Manufactures of .	43,673	119,965
Cotton and Manufactures	27,267	99,817	Paper and Manufactures of .	—	93,045
Sugar, Molasses, &c.	16,797	86,070	Wood Pulp .	6,365	71,552
Wool and Manufactures	28,470	67,018	Wheat Flour .	20,581	66,520
Petroleum and its Products .	16,995 ¹	50,742	Iron and Manufactures of .	2,809	63,973
Drugs, Dyes, and Chemicals	15,327	36,335	Cheese .	18,869	37,147
Spirits and Wines, potable	7,392	34,654	Bacon and Hams, &c. .	3,763	31,492
Fruits . . .	16,633	31,856	Cattle . . .	7,907	21,464
Cotton Wool or Raw Cotton, not dyed .	9,752	28,542	Foreign Produce . . .	47,408	21,264
Silk, not manufactured .	9,251 ²	27,150	Coal . . .	3,704	16,501
Grains, Flours, &c. . .	7,169	21,015	Oats . . .	13,380	14,152
Wood, unmanufactured and partly manufactured .	16,202	19,025	Agricultural Implements . . .	7,932	12,527
Flax, Hemp, Jute, and Manufactures	8,422	14,926	Furs . . .	5,623	12,211
Paper, all kinds not printed .	8,062	13,636	Silver in Ore, &c. . .	20,972	11,127
Books and Printed Matter .	6,463	13,575	Fruits . . .	4,584	10,321

¹ Oils, all kinds.² Silk and Manufactures.

CANADA—*Continued.*

CLASSES OF IMPORTS AND EXPORTS, 1921.

	Imports.		Exports.	
	1,000 Dollars.	Per cent.	1,000 Dollars.	Per cent.
Vegetable Products . . .	261,081	21·05	482,925	40·61
Animals and their Products . . .	61,722	4·98	188,360	15·84
Fibres, Textiles and Textile Products . . .	243,608	19·64	17,784	1·58
Wood, Wood Products and Paper . . .	57,449	4·63	284,561	23·93
Iron and its Products . . .	245,626	19·81	76,501	6·43
Non-ferrous Metals and their Products . . .	55,553	4·48	46,177	3·88
Non-metallic Minerals and their Products . . .	206,095	16·62	40,035	3·37
Chemicals and Allied Products . . .	36,335	2·93	19,344	1·63
All Other Commodities . . .	72,688	5·86	32,477	2·73

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913-14.	1920-21.	1913-14.	1920-21.
United States . . .	1,000 Dollars. 410,786	1,000. Dollars. 856,177	1,000 Dollars. 176,948	1,000 Dollars. 560,702
Great Britain . . .	132,071	213,974	222,322	314,229
Cuba	—	30,743	—	6,574
France	14,277	19,138	3,811	27,522
British West Indies . . .	9,443	14,834	4,895	13,135
British East Indies . . .	7,282	14,307	—	6,408
Switzerland	4,315	14,143	—	1,492
Japan	2,604	11,361	—	6,479

Money.—Dollar=100 cents=4s. 2d. nearly; £1=4·86 dollars.

Weights and Measures.—British, except that a hundredweight=100 lb., and a ton=2000 lb. avoirdupois, as in the United States.

NEWFOUNDLAND AND LABRADOR.

Imports.	1912-13.	1920-21.	Exports.	1912-13.	1920-21.
Total . .	1,000 Dollars. 16,457	1,000 Dollars. 29,811	Total . .	1,000 Dollars. 15,080	1,000 Dollars. 23,143
Flour . .	1,990	4,054	Dried Cod . .	7,987	13,335
Hardware . .	1,007	3,331	Pulp and Paper . .	2,427	4,893
Textiles . .	1,997	2,535	Herring . .	414	724
Coal . .	948	2,451	Iron Ore, &c. .	1,368	622
Machinery . .	797	1,402	Cod Oil . .	265	474
Molasses . .	308	806	Lobsters (tinned) . .	477	305
Salt Pork . .	648	735	Seal Oil . .	270	248
Tea . .	270	285	Seal Skins . .	322	148

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1912-13.	1920-21.	1912-13.	1920-21.
United Kingdom	1,000 Dollars. 4,405	1,000 Dollars. 3,230	1,000 Dollars. 3,427	1,000 Dollars. 6,275
Canada	5,682	14,842	2,786	1,976
United States	5,574	9,556	1,331	1,854

Money.—The gold dollar = 4s. 1½d.

WEST INDIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
Bahamas	£1,000. 404	£1,000. 1,096	£1,000. 264	£1,000. 378
Barbados	1,465	5,146	996	4,866
Jamaica	2,837	5,474	2,430	3,358
Windward Islands	123	622	115	611
Leeward Islands	641	1,560	563	1,900
Trinidad and Tobago	2,829	6,904	3,066	4,684

BARBADOS.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000. 1,465	£1,000. 5,146	Total . . .	£1,000. 996	£1,000. 4,866
Fish, Dried, &c.	—	538	Sugar . . .	91	515
Coal . . .	82	511	Molasses . . .	377	404
Cotton Manufactures . . .	—	478	Rum . . .	—	16
Flour . . .	79	353	Cotton, raw . . .	23	6
Manures . . .	89	218			
Meats, Salted and Preserved . . .	—	202			
Rice . . .	60	183			

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports	
	1913.	1921.	1913.	1921.
United Kingdom	£1,000. 519	£1,000. 947	£1,000. 55	£1,000. 106
United States	381	585	69	67
British North America	192	594	312	653

JAMAICA.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total	£1,000. 2,837	£1,000. 5,474	Total	£1,000. 2,430	£1,000. 3,358
Flour	340	632	Bananas	1,078 ¹	1,544
Cotton Goods	300	561	Sugar	52	510
Fish	222	375	Rum	101	192
			Coffee	159	161
			Coco-nuts	135	145
			Logwood Extract	170	109
			Cacao	115	97
			Logwood	106	28

¹ Fresh fruit.

JAMAICA—Continued.

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United States	£1,000. 1,327	£1,000. 2,991	£1,000. 1,396	£1,000. 1,624
United Kingdom	1,088	1,601	424	995

TRINIDAD AND TOBAGO.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000. 2,829	£1,000. 6,904	Total . . .	£1,000. 3,066	£1,000. 4,684
Articles wholly or mainly Manufactured			Cacao . . .	1,403	1,523
Food, Drink, and Tobacco .	1,076	3,571	Sugar . . .	418	1,459
Raw Materials and Articles mainly Unmanufactured	1,452	2,749	Crude Petroleum	75	462
Bullion and Specie . .	243	504	Asphalt . . .	231	235
	—	61	Petrol Spirit . .	—	173
			Coco-nuts . . .	85	114
			Refined Kerosene . . .	—	93
			Copra . . .	—	62
			Rum . . .	—	59
			Bitters . . .	—	33
			Transhipment Trade (included in above)	2,140	510

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United States	£1,000. 814	£1,000. 2,458	£1,000. 1,393	£1,000. 1,336
United Kingdom	893	1,727	495	1,899
Venezuela	469	937	—	58
British North America	256	1,155	175	386

BERMUDA.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . .	£1,000. 571	£1,000. 1,340	Total . .	£1,000. 91	£1,000. 225
Provisions . .	20	266	Potatoes . .	39	92
Clothing . .	24	66	Whisky . .	—	55
Cotton Goods . .	32	66	Other Vegetables . .	18	33
Beef . . .	—	48			
Coal . . .	9	48			
Spirits . . .	—	48			
Fuel Oil . . .	—	46			
Electrical Goods . .	—	44			
Hardware . .	16	44			
Flour . . .	20	39			
Oats . . .	18	33			
Ale . . .	14	31			

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United States	£1,000. 325	£1,000. 749	£1,000. 82	£1,000. 213
United Kingdom	155	351	5	12
British North America	75	221	—	—

Money, Weights, and Measures.—British throughout the West Indies; in some of the islands American coins are current.

BRITISH GUIANA.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000, 1,694	£1,000, 3,488	Total . . .	£1,000, 2,193	£1,000, 3,424
Machinery . .	68	566	Sugar . . .	1,102	2,104
Textiles manu- factured . .	282	394	Rum . . .	204	364
Flour . . .	154	304	Diamonds . .	17	342
Manures . . .	132	181	Balata Gum . .	160	204
Oils . . .	61	102	Rice . . .	106	59
Hardware, Im- plements and Tools . . .	31	87	Timber . . .	35	21

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom	£1,000, 907	£1,000, 1,528	£1,000, 1,015	£1,000, 2,009
British North America	240	610	797	1,012
United States	377	814	80	89

Money.—Dollar = 4s. 2d. British coins also in circulation.

BRITISH HONDURAS.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000 655	\$1,000. 3,348	Total . . .	£1,000. 642	\$1,000. 3,052
Chicle . . .	72	419	Chicle . . .	200	1,324
Cotton and Silk Piece Goods . .	44	238	Mahogany . . .	210	1,054
Flour . . .	22	212	Bananas . . .	30	169
Milk Preserved or Condensed . .	—	127	Coco-nuts . . .	33	143
Boots and Shoes . .	25	116			
Apparel . . .	14	93			

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United States	£1,000. 314	\$1,000. 1,887	£1,000. 475	\$1,000. 2,313
United Kingdom	148	503	62	491
Mexico	105	511	50	200

Money.—United States gold is the standard of currency; £1=4·86 dollars.

A S I A.

INDIA.

PRIVATE MERCHANDISE.

Imports (Sea-borne Trade).	1913-14.	1921-22.	Exports (Sea-borne Trade).	1913-14.	1921-22.
Total . . .	Rs. 1,000. 1,381,693	Rs. 1,000. 2,807,122	Total . . .	Rs. 1,000. 2,490,062	Rs. 1,000. 2,486,576
Cotton Manufactures (including Twist and Yarn)	662,993	569,381	Colton, raw . . .	410,425	539,683
Machinery and Millwork . . .	77,583	342,551	Jute, manufactured . . .	282,731	209,957
Sugar . . .	149,569	275,028	Rice . . .	266,085	249,182
Metals and Ores.	220,740	261,985	Tea . . .	149,751	182,202
Railway Plant and Rolling Stock . . .	100,347	189,106	Seeds (mainly Oil) . . .	256,754	174,069
Grain and Pulse . . .	2,798	93,559	Cotton, manufactured (including Twist and Yarn) . . .	1,200	156,507
Oils . . .	44,019	75,614	Jute, raw . . .	308,264	140,492
Hardware . . .	39,481	59,190	Hides and Skins . . .	159,487	99,021
Coal, Coke, and Patent Fuel . . .	10,664	58,505	Wheat and Wheat Flour . . .	143,845	33,385
Instruments, Apparatus, &c., and Parts . . .	—	51,481	Oils . . .	9,856	28,434
Silk (raw and manufactured)	43,719	43,394	Wool, raw . . .	25,045	25,446
Liquors . . .	22,371	37,662	Opium . . .	34,200	20,542
Dyeing and Tanning Substances	14,139	32,052	Treasure . . .	70,521	190,673
Motor Cars, Cycles, and Parts . . .	—	27,173			
Provisions . . .	24,736	27,036			
Treasure . . .	366,204	312,991			

INDIA—*Continued.*

DISTRIBUTION OF SEA-BORNE TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913-14.	1921-22.	1913-14.	1921-22.
	Rs. 1,000.	Rs. 1,000.	Rs. 1,000.	Rs. 1,000.
United Kingdom . . .	1,175,826	1,509,206	573,552	463,161
Japan . . .	47,801	135,796	226,738	380,884
United States . . .	47,904	216,084	217,783	249,320
China . . .	26,876	42,536	133,548	173,844
Germany . . .	126,658	72,455	263,558	160,546
Ceylon . . .	8,085	13,798	87,985	115,671
France . . .	26,916	22,339	176,827	98,408
Belgium . . .	42,578	53,294	120,648	80,121
Straits Settlements . . .	34,226	40,778	65,512	74,469

DISTRIBUTION OF OVERLAND TRADE WITH OTHER COUNTRIES
(EXCLUDING TREASURE).

	Imports.		Exports.	
	1913-14.	1921-22.	1913-14.	1921-22.
	Rs. 1,000.	Rs. 1,000.	Rs. 1,000.	Rs. 1,000.
Total	108,589	151,161	83,886	125,806
Shan States	20,166	39,581	18,270	46,459
Nepal	43,275	59,142	20,480	24,927
SW. Afghanistan	9,444	5,750	6,515	11,319
Western China	2,892	8,502	5,615	10,023
Persia	262	4,687	2,163	8,374
Dir, Swat, and Bajaur	7,819	3,151	8,677	6,534
Waziristan	—	5,780	—	3,144

Money, Weights, and Measures.—The Metric measures have been legalised, but are not used. The unit of measure is the maund, which varies from 25 lb. in Madras and 28 lb. in Bombay to over 82 lb. in Bengal. Indian statistics are usually expressed in tens of rupees (Rs.); 1 rupee = 16 annas = 2s. 100,000 rupees is called a lakh (=£10,000); 10,000,000 rupees is a crore.

CEYLON.

Imports.	1918.	1921.	Exports.	1918.	1921.
Total . .	£1,000. 13,309	£1,000. 26,205	Total . .	£1,000. 15,658	£1,000. 25,660
Rice . .	3,352	4,640	Tea . .	5,853	7,514
Coal and Coke	993	2,024	Rubber . .	4,452	3,585
Cotton Manu- factures .	900	1,647	Coco-nut, De- siccated .	—	1,773
Sugar . .	371	704	Copra . .	1,397	1,620
Manures . .	494	151	Coco-nut Oil .	1,116	1,002
Spirits . .	125	140	Areca Nuts .	203	220
			Coco-nut, Fresh	93	157
			Coir and Manu- factures . .	223	135
			Cacao . .	201	135
			Cinnamon .	161	120
			Citronella Oil .	—	73
			Plumbago .	603	51

PERCENTAGE DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1918.	1921.	1918.	1921.
United Kingdom	Per cent.	Per cent.	Per cent.	Per cent.
United Kingdom	29·2	25·1	45·5	47·5
India	40·8	24·5	2·4	3·1
United States	1·3	2·7	16·6	22·0
Australasia	1·5	2·3	6·2	6·3
Germany	3·2	0·6	10·1	4·1

Money.—1 rupee=100 cents=before 1921 £1_{5s}, 1921 £1_{6s}.

Weights and Measures.—British.

STRAITS SETTLEMENTS.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000. 55,936	£1,000. 68,126	Total . . .	£1,000. 45,375	£1,000. 58,025
Rice and other Grains . . .	6,596	8,859	Gums, includ- ing Rubbers .	3,093	11,954
Tin Ore . . .	11,331	7,349	Tin . . .	13,174	6,819
Tobacco, Cigars, and Cigarettes	1,327	3,455	Copra . . .	2,314	3,222
Cotton Piece Goods, Yarns, &c. . .	3,381	3,252	Spices, includ- ing Pepper .	—	1,868
Sugar . . .	1,237	2,114	Pineapples, Preserved . .	—	725
Fish, Dried and Salted . . .	1,399	1,996	Rattans . . .	—	724
Coal . . .	1,345	1,962	Tapioca . . .	—	540
Hardware and Ironware, in- cluding Cook- ing Utensils .	—	1,107	Sago . . .	—	430
Vegetables and Fruits . . .	—	799	Gambier . . .	—	166
Live Animals .	—	677	Phosphates of Lime . . .	—	156
Provisions .	—	380	Hides, Raw . .	—	35
Bullion and Specie . . .	2,926	2,335	Bullion and Specie . . .	1,865	1,887

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom . . .	£1,000. 6,176	£1,000. 7,822	£1,000. 10,745	£1,000. 5,724
Other parts of Empire . . .	26,897	29,767	14,117	16,664
Foreign Countries . . .	22,864	30,537	20,513	35,637

Money.—1 dollar=2s. 4d.

Weights and Measures.—The English yard is the measure of length, and the acre of area; 100 kati=1 pikul=133½ lb.; 1 gantang=1 gallon; 1 chupak=1 quart.

FEDERATED MALAY STATES.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . .	£1,000. 9,818	£1,000. 12,007	Total . .	£1,000. 17,287	£1,000. 15,745
Rice . .	2,215	1,931	Cultivated Rubber . .	6,611	7,867
Machinery . .	340	1,375	Tin and Tin Ore . .	9,783	5,843
Tobacco, Cigars and Cigarettes . .	433	724	Copra . .	211	883
Petroleum, in- cluding Ben- zine . .	307	610	Timber . .	—	62
Ironware . .	364	445	Hides . .	—	10
Opium . .	256	383	Metals . .	—	6
Cotton Piece Goods . .	323	373			
Sugar . .	182	262			
Milk, Con- densed . .	—	248			
Live Animals . .	445	207			
Spirits . .	200	181			

	PERAK.		SELANGOR.		NEGRI SEMILAN.		PAHANG.	
	1913.	1921.	1913.	1921.	1913.	1921.	1913.	1921.
Imports	£1,000. 3,962	£1,000. 3,832	£1,000. 4,805	£1,000. 6,573	£1,000. 747	£1,000. 882	£1,000. 304	£1,000. 720
Exports	8,330	7,724	6,638	5,672	1,559	1,581	760	768

PERCENTAGE DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

		Imports. 1921.	Exports. 1921.
Singapore		41·1	40·0
Penang		22·4	39·1
United Kingdom		15·9	8·6
Other Parts of Empire		9·6	11·8
Foreign Countries		11·0	8·2

Money, Weights, and Measures.—As in Straits Settlements.

AUSTRALASIA.

COMMONWEALTH OF AUSTRALIA.

Imports.	1913.	1921-22.	Exports.	1913.	1921-22.
Total . .	£1,000. 79,750	£1,000. 102,620	Total . .	£1,000. 78,572	£1,000. 127,949
Textiles . .	4,030 ¹	14,220	Wool . .	26,277	47,975
Metal Manufactures, including Vehicles .	11,782	12,007	Wheat . .	7,987	28,644
Cotton Piece Goods . .	4,574 ²	10,038	Butter . .	3,565	7,988
Agricultural and other Machinery . .	4,302	7,911	Flour . .	1,864	5,520
Apparel, including Boots . .	5,786	5,551	Skins and Hides . .	5,546	3,142
Oils and Waxes . .	1,783	5,145	Mutton and Lamb . .	1,993	2,139
Drugs, Chemicals, and Fertilizers . .	2,493	3,429	Milk . .	—	2,133
Paper and Paper Boards . .	1,997	3,388	Beef . .	2,652	1,868
Tobacco . .	1,115	2,471	Lead, pig . .	1,848	1,730
Bags and Sacks . .	1,865	2,132	Tallow . .	2,163	1,432
Iron and Steel, plate and sheet	—	1,992	Coal . .	1,122	1,100
Alcoholic Liquors . .	1,375	1,580	Silver . .	431	855
Yarns, woollen . .	—	1,072	Leather and Manufactures . .	628	835
Tinned Plates . .	—	578	Bullion and Specie . .	2,192	4,349
Bullion and Specie . .	377	43			

¹ Woollens and Silk Goods.² Cotton and Linen Goods.

COMMONWEALTH OF AUSTRALIA—*Continued.*

COMMONWEALTH TRADE ARRANGED IN CLASSES.

	Imports.		Exports of Australian Produce.	
	1909-13.	1920-21.	1909-13.	1920-21.
Animal Foodstuffs	£1,000. 885	£1,000. 1,224	£1,000. 8,546	£1,000. 20,980
Vegetable Foodstuffs	2,926	8,736	10,312	43,554
Beverages (non-alcoholic)	1,685	1,997	5	59
Alcoholic Liquors	1,712	2,000	136	611
Tobacco	889	3,842	73	369
Live Animals	247	76	287	386
Animal Substances	355	2,325	31,086	37,743
Vegetable Substances	1,281	4,251	223	357
Apparel	17,730	49,878	76	1,165
Oils	1,771	8,429	2,030	1,731
Paints	534	627	6	180
Stones	245	209	1,000	2,364
Ores and Metals, unmanufactured	1,493	1,510	8,244	4,665
Machinery and Metals, manufactured	15,854	39,149	286	1,303
Rubber and Leather	1,501	3,277	618	1,605
Wood	3,029	5,949	1,012	1,472
Earthenware	1,203	3,185	15	225
Paper	2,728	8,979	65	195
Jewellery	1,534	2,538	156	259
Instruments	527	1,125	6	68
Drugs	2,377	5,588	283	915
Miscellaneous	5,185	8,882	191	760
Gold and Silver and Bronze Specie	1,518	26	7,742	5,465

COMMONWEALTH OF AUSTRALIA—*Continued.*TRADE OF THE STATES OF THE COMMONWEALTH
(EXCLUDING INTER-STATE TRADE).

	Imports.		Exports.	
	1913.	1921-22.	1913.	1921-22.
Total	£1,000. 79,750	£1,000. 102,620	£1,000. 78,524	£1,000. 127,949
New South Wales	32,351	43,310	32,840	48,035
Victoria	24,387	36,032	17,838	34,706
South Australia	7,348	8,919	9,810	14,762
Western Australia	5,408	4,319	5,102	10,800
Queensland	6,715	8,641	12,353	17,573
Tasmania	1,025	1,386	514	2,067
Northern Territory	21	13	68	5

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1920-21.	1913.	1920-21.
United Kingdom	£1,000. 47,616	£1,000. 84,562	£1,000. 34,757	£1,000. 67,520
United States	9,523	35,602	2,631	9,966
New Zealand	2,514	2,302	2,357	7,781
Belgium	2,259	1,343	7,466	6,846
France	625	390	9,684	6,410
Japan	919	5,348	1,429	3,118
Union of South Africa	127	416	1,941	3,050
Dutch East Indies	714 ¹	7,486	687 ¹	2,569
Italy	—	666	—	2,548
India	2,964	7,137	1,355	2,193

¹ Java.

DOMINION OF NEW ZEALAND.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000, 22,288	£1,000, 42,942	Total . . .	£1,000, 22,987	£1,000, 44,829
Drapery and Textiles . .	4,677	4,855	Butter . . .	3,832 ²	11,170
Metal Manufactures . .	4,530	4,356	Frozen Meat . .	4,450	11,164
Machinery and Machines . .	3,735	—	Cheese . . .	—	8,199
Oils . . .	570	2,805	Wool . . .	8,058	5,221
Iron and Steel . .	—	2,565	Milk, preserved . .	—	1,109
Motor Cars, Cycles, and Materials . .	—	2,227	Sheep Skins and Pelts . . .	—	957
Apparel . . .	1	2,122	Tallow . . .	663	867
Sugar . . .	813	2,067	Gold . . .	1,459	612
Books, Paper, and Stationery . .	859	2,041	Hides and Skins . .	1,181 ³	575
Drugs, Chemicals, and Drug-gists' Wares . .	—	1,082	Timber . . .	—	504
Tobacco, Cigars, &c. . . .	466	1,049	Agricultural Produce . .	133	490
			British and Foreign Produce. .	232	1,213

¹ Included under Drapery and Textiles. ² Butter and Cheese. ³ Including Sheep Skins.

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom	£1,000, 13,312	£1,000, 21,449	£1,000, 18,130	£1,000, 38,717
United States	2,108	7,746	912	2,702
Australia	2,915	6,487	2,316	2,070
Canada	—	1,688	—	455
Pacific Islands	900	1,909 ¹	295	517
India and Ceylon	714	910	44	71

¹ Fiji Islands.

Money, Weights, and Measures.—British.

II.—NON-BRITISH LANDS.

ALGERIA.

Imports.	1913.	1922.	Exports.	1913.	1922.
Total . . .	1,000 Francs. 667,500	1,000 Francs. 2,007,089	Total . . .	1,000 Francs. 510,500	1,000 Francs. 1,379,491
Paper . . .	19,125	96,048	Wines . . .	146,564	426,509
Clothing . . .	17,061	75,367	Sheep . . .	39,756	104,258
Sugar . . .	12,763	74,737	Tobacco }	13,288	{ 45,654
Petroleum . . .	—	56,144	Cigarettes }	—	{ 38,696
Automobiles . . .	—	50,842	Wheat . . .	33,360	35,505
			Silk, raw . . .	—	15,726
			Eggs . . .	—	10,698

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1922.	1913.	1922.
Total	£1,000. 26,700	1,000,000 Francs. 2,007	£1,000. 20,420	1,000,000 Francs. 1,379
France	14,014	1,543	13,742	975
United Kingdom	825	41	960	46

Money, Weights, and Measures.—As in France.

ARGENTINE REPUBLIC.

Imports.	1914.	1920.	Exports.	1914.	1920.
Total . . .	£1,000. 54,364	1,000 Pes. Oro. 934,968	Total . . .	£1,000. 69,851	1,000 Pes. Oro. 1,044,085
Textiles . . .	10,504	288,271	Agricultural Pro- ducts . . .	35,583	690,347
Iron and Steel .	7,031	138,189	Live Stock Pro- ducts . . .	29,287	312,634
Glassware and Crockery . . .	5,769	92,941	Forest Products .	1,783	10,190
Foodstuffs . . .	4,665	83,277			
Oils . . .	4,011	51,556			
Chemicals . . .	2,222	46,938			
Timber and Wood .	1,172	45,282			
Paper . . .	1,484	25,914			
Agricultural Im- plements, &c.	648	16,690			
Tobacco . . .	1,181	13,048			
Beverages . . .	1,626	12,667			
Electrical Goods	1,405	12,580			

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports		Exports	
	1914.	1920.	1914.	1920.
United Kingdom	£1,000. 18,495	1,000,000 Pes. Oro. 219	£1,000. 20,430	1,000,000 Pes. Oro. 280
United States	7,337	310	8,573	154
France	4,479	55	3,994	71
Belgium	2,428	16	3,501	53
Italy	4,974	41	1,710	34
Germany	7,999	45	6,146	24

Money.—1 peso oro = 4½s.; 1 paper dollar = a little less than 1s. 9d.

Weights and Measures.—Metric.

*AUSTRIA.

The post-war trade of Austria is given by weight only.

Imports.	1921.	Exports.	1921.
	1,000 Tons.		1,000 Tons.
Total	8,196	Total	1,487
Coal and Fuel . . .	5,918	Timber	400
Grain, Flour, and Rice . . .	756	Paper Goods	114
Stone and Building Material . . .	127	Ores	79
Wines	89	Chemicals	51
Iron Goods	41	Furniture	40
Textiles	28	Sugar Beet	20
Cotton, raw	26		
Glass	17		
Rubber	2		

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES, 1921.

	Imports.	Exports.		Imports.	Exports.
	1,000 Tons.	1,000 Tons.		1,000 Tons.	1,000 Tons.
Italy . . .	130	350	Poland . . .	469	85
Germany . .	2,907	270	Switzerland . .	20	78
Czechoslovakia . .	3,363	249	United States .	165	60
Hungary . .	269	168	United Kingdom ¹ . .	61	8
Yugoslavia . .	288	138			

¹ United Kingdom (£1,000).

*Money.—1 krone=100 heller=(normally) 1 franc.
Weights and Measures.—Metric.*

*BELGIUM.

Imports.	1913.	1921.	Exports.	1913.	1921.
	1,000 Francs.	1,000 Francs.		1,000 Francs.	1,000 Francs.
Total . . .	4,583,625	10,051,435	Total . . .	3,576,825	7,147,327
Wheat Flour . .	393,186	1,688,098	Coal . . .	90,220	861,953
Coal . . .	161,957	677,972	Iron and Steel manufactured . .	251,315	617,409
Wool . . .	410,198	605,162	Wool (Yarn) . .	65,092	499,727
Machinery . . .	107,036	496,150	Cotton and Wool- len Textiles . .	—	309,006
Chemicals . . .	141,696	478,963	Sugar . . .	—	289,678
Cotton . . .	210,420	383,968	Grain and Flour . .	73,123 ¹	270,564
Cotton and Wool- len Textiles . .	—	337,255	Machinery . . .	77,112	249,104
Bitumen . . .	—	270,183	Cotton (Yarn) . .	84,348	213,551
Meat . . .	—	257,871	Glassware . . .	45,741 ²	206,997
Milk, Butter, Cheese . . .	—	223,095	Flax . . .	132,823	180,398
Ores: Copper, Iron, Zinc, Manganese . .	—	200,278	Chemicals . . .	93,601	178,368
Building Wood .	124,505	191,958	Cement . . .	—	115,313
Iron and Steel .	—	181,817	Bitumen . . .	—	101,630
Wine . . .	40,842	179,691	Crude Minerals . .	—	75,687
Iron and Steel manufactured . .	—	162,338	Vegetables . .	—	69,053

¹ Wheat.² Window Glass.

BELGIUM—*Continued.*

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913. Francs.	1921. Francs.	1913. Francs.	1921. Francs.
France	1,000,000 1,000	1,000,000 1,733	1,000,000 762	1,000,000 1,613
United Kingdom	519	1,180	545	1,256
Germany	762	1,383	940	1,090
Netherlands	357	945	321	952
Switzerland	—	88	—	305
United States	420	1,606	106	206
Italy	—	91	—	119
Argentine Republic	317	712	91	103

Money.—Belgium belongs to the Latin Monetary Union; the unit is the franc=(normally) 9½d., or 25 to the £. *Weights and Measures*—Metric.

BOLIVIA.

Total Trade.	1913.	1921.	Trade with United Kingdom.	1918.	1921.
Imports . . .	£1,000. 4,555	£1,000. 4,810	Imports . . .	£1,000. 360	£1,000. 409
Exports . . .	7,968	—	Exports . . .	2,250	1,717

Money, Weights, and Measures.—12½ bolivianos=£1. The Metric is the legal system, but the old Spanish system is still in use.

BRAZIL.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000. 67,166	£1,000. 60,468	Total . . .	£1,000. 64,849	£1,000. 58,587
Machinery . . .	—	9,539	Coffee . . .	40,778	34,694
Iron and Steel Products . . .	—	6,963	Sugar . . .	65	3,292
Wheat . . .	—	6,632	Frozen and Chilled Meat . . .	—	2,376
Coal and Coke . . .	—	2,987	Tobacco . . .	1,638	1,933
Cotton Goods . . .	—	2,532	Leather . . .	2,226	1,767
Beverages . . .	—	1,234	Cacao . . .	1,593	1,682
Live Stock . . .	—	181	Cotton . . .	2,306	1,556
			Yerba Maté (Paraguayan Tea) . . .	2,364	1,492
			Rubber . . .	10,375	1,231
			Hides . . .	771	749

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United States	£1,000. 10,253	£1,000. 19,148	£1,000. 20,487	£1,000. 21,665
France	6,380	3,775	7,728	5,798
Germany	11,395	4,864	8,867	5,570
United Kingdom	15,956	12,337	8,330	4,074
Netherlands	707	523	4,645	4,018
Argentine Republic	4,852	6,903	2,966	3,848
Italy	2,470	1,760	812	3,810

Money.—The milreis is equivalent to 2s. 2·934d. (par value).

Weights and Measures.—The French Metric System is compulsory, but the old system is still sometimes employed in parts of the interior.

*BULGARIA.

Imports.	1913.	1921.	Exports.	1913.	1921.
		1,000 Leva.			1,000 Leva.
Total . . .	£1,000. 6,850	2,921,092	Total . . .	£1,000. 3,728	2,217,327
Textiles . . .	1,380	1,260,677	Tobacco . . .	—	588,615
Metals . . .	540	351,687	Wheat . . .	816	484,791
Machinery . . .	975	185,785	Maize . . .	173	164,780
Skins . . .	343	183,005	Hides . . .	150	76,236
Tar . . .	—	176,192	Barley . . .	—	49,168
Oils . . .	—	84,676	Attar of Roses .	306	35,480

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
	£1,000.	1,000 Leva.	£1,000.	1,000 Leva.
Turkey	255	115,648	169	528,089
Greece	—	83,487	199	249,620
Germany	1,483	458,336	675	219,731
France	517	301,429	203	135,295
Belgium	165	86,569	602	116,843
Austria	—	263,125	—	107,199
United Kingdom	675	448,692	318	15,610

Money.—A lev is equivalent to a franc. (See France.)

Weights and Measures.—Metric.

CHILE.

	Imports.		Exports.	
	1913.	1920.	1913.	1920.
Total	1,000 Pesos. 329,518	1,000 Pesos. 341,309	1,000 Pesos. 396,310	1,000 Pesos. 778,869
Products of Mining . .	61,028	29,381	346,209	656,254
" " Live Stock . .	21,502	12,300	25,225	46,764
" " Agriculture . .	—	30,768	19,399	32,584
Foods	—	43,293	—	24,563
Products of Forestry . .	9,811	3,412	—	5,555
Chemical Products . .	8,332	52,277	—	1,002
Textiles	76,843	117,141	—	542
Metals	—	41,602	—	13

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1920.	1913.	1920.
	1,000,000 Pesos.	1,000,000 Pesos.	1,000,000 Pesos.	1,000,000 Pesos.
United States	55	140	83	344
United Kingdom	99	116	152	104
France	18	28	24	32
Netherlands	—	—	12	21
Spain	—	—	3	17

Money.—The gold peso is equivalent to 1s. 6d.; $13\frac{1}{2}$ pesos = £1.

Weights and Measures.—Metric. The old Spanish system is also employed.

CHINA.

(EXCLUSIVE OF HONG-KONG.)

Imports.	1906-10.	1921.	Exports.	1906-10.	1921.
	1,000 Haikwan Tael.s.	1,000 Haikwan Tael.s.		1,000 Haikwan Tael.s.	1,000 Haikwan Tael.s.
Total . .	420,460	1,051,894	Total . .	299,475	704,329
Cotton Yarn and Manufactures .	130,102	217,860	Silk and Silk Manufactures . .	86,543	152,719
Machinery .	7,081	84,179	Beancake . .	12,952	49,525
Sugar . .	25,041	72,214	Beans . .	13,948	35,249
Metals of all kinds . .	19,734	60,078	Oil (Bean, Groundnut, &c. . .)	6,767	21,081
Oil, Kerosene .	20,935	58,097	Cereals . .	—	19,181
Rice . .	23,858	41,263	Seeds . .	—	17,684
Cigars and Cigarettes .	5,801	26,233	Cotton, raw .	16,306	17,257
Coal . .	8,302	14,421	Skins, Skin Clothing and Rugs . .	7,978	15,954
Fish and Fishery Products .	8,378	14,329	Hides (Cow and Buffalo) Wool . .	7,721	
Wool and Woollen Manufactures . .	6,146	7,656	Tea . .	32,149	13,298
Flour . .	6,669	3,524	Straw Braid .	7,768	12,606
Opium . .	37,264	323	(See p. 175 n.)		3,452

CHINA—*Continued.*

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1906-10.	1921.	1906-10.	1921.
British Possessions	1,000 Haikwan Taels.	1,000 Haikwan Taels.	1,000 Haikwan Taels.	1,000 Haikwan Taels.
Japan	192,336	287,230	107,002	184,590
United Kingdom	61,549	222,320	44,587	187,210
United States	73,608	149,940	15,249	30,910
France	35,998	175,790	28,166	89,540
Russia	2,957	9,640	33,115	23,950
Germany	8,317	8,760	30,388	22,870
	16,823	13,350	7,967	6,770

Money.—The unit is the copper cash=about $\frac{1}{8}$ d. About 1000 of these units are equivalent to 1 haikwan tael, or about 3s. 11 $\frac{1}{2}$ d. (1921). The silver dollar (similar to the Mexican dollar) is also much used in all the provinces. Its standardisation is now being taken in hand.

Weights and Measures.—16 liang (tael)=1 chin or catty: 100 chin=1 tan (picul) or 133 $\frac{1}{3}$ lb. (avoirdupois); 1 ch'ih=1.175 feet; 10 ch'ih=chang or 2 fathoms; 1 li=2115 feet (usually taken as $\frac{1}{2}$ mile).

COLOMBIA.

Total Trade.	1913.	1921.	Exports.	1921.
Imports	£1,000. 5,397	£1,000. 6,611	Coffee . .	1,000 Gold Pesos. 41,945
Exports	6,863	8,389	Platinum . .	3,506
Imports from United Kingdom, merchandise	1,693	1,404	Bananas . .	2,215
Exports to United Kingdom, merchandise .	1,089	2,789	Hides . .	976
			Gold . .	124

Money.—1 gold dollar = 4s.

Weights and Measures.—Metric. Colombian measures also commonly used. 1 arroba = 25 Colombian lb. = 12½ kilos; 1 quintal = 100 Colombian lb.; 1 vara = 80 cm.

COSTA RICA.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total	£1,000. 1,787	£1,000. 2,391	Total . . .	£1,000. 2,124	£1,000. 3,096
General Merchandise	—	2,269	Bananas . .	1,069	1,511
Cattle	—	122	Coffee . .	742	999
			Gold, Silver, &c. . .	210	162
			Cacao . .	22	137
			Sugar . .	—	125

PERCENTAGE DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United States	51·4	52·9	50·8	68·1
United Kingdom	14·9	16·9	41·8	25·1
Spanish America	—	8·1	—	3·2

Money.—The gold colon = 22 9d.

Weights and Measures.—Metric. The old Spanish system is still in use in the country districts.

*CZECHOSLOVAKIA.

Imports.	1921.	Exports.	1921.
	1,000 Crowns. 22,435,536		1,000 Crowns. 27,312,189
Total		Total	
Cereals	4,532,054	Woollens	4,134,128
Cottons	3,446,545	Sugar	3,748,751
Woollen Goods . .	2,066,297	Timber, Coal, and Peat	2,901,272
Chemicals	602,116	Glass	2,072,702
Timber, Coal, and Peat	571,454	Iron	1,288,561
Silk	475,805	Fruit	657,789
Leather	380,758		

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports. 1921.	Exports. 1921.
Austria	1,000 Crowns. 1,983,000	1,000 Crowns. 7,835,000
Germany	5,862,000	3,061,000
United States	4,547,000	771,000
Hungary	926,000	3,066,000
United Kingdom	1,341,000	2,104,000

*Money.—1 crown=(normally) 1 franc.
Weights and Measures.—Metric.*

DENMARK.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
Total	1,000 Kroner. 777,424	1,000 Kroner. 1,548,699	1,000 Kroner. 637,360	1,000 Kroner. 1,410,220
Provisions, Eggs, &c. .	26,316	30,585	459,418	1,030,658
Animals	10,042	15,157	68,726	112,229
Cereals	115,465	154,990	13,370	25,118
Metals and Hardware .	71,215	145,347	8,058	17,840
Colonial Goods . . .	40,047	74,552	9,306	7,757
Textile Manufactures .	51,796	116,411	1,074	5,096
Wood and Manufactures	46,993	57,511	1,722	3,339
Beverages	5,552	9,247	1,819	2,275
Coal	70,560	119,235	9	—

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom . . .	1,000 Kroner. 134,562	1,000 Kroner. 305,360	1,000 Kroner. 410,418	1,000 Kroner. 825,552
Germany	328,308	461,748	178,694	211,187
Sweden	71,104	97,989	34,083	139,351
Norway	8,755	40,589	19,300	82,266
United States	86,979	342,597	7,853	42,761

Money.—1 krone=100 öre=ls. 1½d., or about 18 kroner=£1.

Weights and Measures.—Metric.

ECUADOR.

Total T. ade.	1913.	1921.	Exports.	1913.	1921.
Imports . . .	1,000 Sucrés. 17,525	1,000 Sucrés. 23,485	Cacao . . .	1,000 Sucrés. 19,782	1,000 Sucrés. 35,573
Exports . . .	31,309	33,969	Tagua, or Ivory Nuts . . .	4,236	5,879
Imports from United Kingdom . . .	4,146	6,158	Coffee . . .	1,001	917
Exports to United Kingdom . . .	4,677	2,419	Panama Hats . . .	2,255	775
			Hides . . .	—	562

Money.—Gold condor=10 sucrés=£1; 1 sucré=2s.

Weights and Measures.—The Metric System is the legal standard, but in commerce the old Spanish system is employed. 1 quintal=101 lb.

* EGYPT.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£E1,000. 27,865	£E1,000. 55,508	Total . . .	£E1,000. 31,662	£E1,000. 36,356
Textiles and Yarns . . .	6,969	14,683	Cotton . . .	25,513	28,375
Cereals and Vegetables . . .	4,242	11,565	Cereals and Vegetables . . .	4,298	4,841
Metals and Manufactures	3,145	7,382	Tobacco . . .	395	704
Wood and Coal	3,839	6,179	Hides and Skins	237	443
Spirits, Oils, &c.	1,411	3,818	Animals and Animal Food Products	298	373
Chemicals, Perfumes, &c. . .	1,343	2,400	Colonial Produce . . .	—	326
Tobacco . . .	1,082	1,973	Specie . . .	11,138	59
Animals and Animal Food Products . . .	1,051	1,362			
Specie . . .	9,791	215			

EGYPT—*Continued.*

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom	£E1,000. 8,496	£E1,000. 16,938	£E1,000. 13,648	£E1,000. 17,046
United States	525	8,356	2,485	6,524
France	2,513	4,167	2,787	2,833
Germany	1,609	1,649	4,066	1,487
Switzerland	—	613	—	1,346
Japan	—	747	—	1,150

Money.—1 gold Egyptian pound = 100 piastres = £1, 0s. 6½d.

Weights and Measures.—1 qantár (kantar) = 100 rotls = 36 okes = 99 lb. ; 1 ardeb = 43·6 gallons, or 5·45 bushels.

*FINLAND.

Imports.	1921.	Exports.	1921.
Total	1,000 Finnish Marks. 3,585,673	Total	1,000 Finnish Marks. 3,389,442
Cereals	715,370	Timber	1,529,039
Coffee, Tea, Sugar, &c. . . .	683,475	Pulp and Paper . . .	1,127,557
Metals	310,075	Meats	438,955
Machinery	276,698	Hides and Leather . . .	56,631
Spinning Materials	249,380	Animals	30,450
Oils and Fats	160,509	Matches	21,520
Textiles	120,555	Gums, Resins, and Tar	10,882
Leather	100,241		

FINLAND—Continued.

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

		Imports. 1921.	Exports. 1921.
		1,000 Finnish Marks.	1,000 Finnish Marks.
Great Britain		708,971	1,142,464
Sweden		267,259	406,067
Germany		1,205,899	372,198
United States		613,899	275,270
Netherlands		190,195	272,542

Money.—Markka = 100 penni = 9½d.

Weights and Measures.—Metric.

* FRANCE.

Imports.	1913.	1921.	Exports.	1913.	1921.
	1,000,000 Francs.	1,000,000 Francs.		1,000,000 Francs.	1,000,000 Francs.
Total . . .	8,421	22,068	Total . . .	6,314	19,772
Coal and Coke .	575	2,813	Textiles, Cotton .	367	1,275
Machinery .	324	1,606	" Silk .	375	1,262
Cereals .	613	1,464	Clothing . .	—	1,218
Cotton, raw .	541	1,386	Automobiles .	217	666
Petroleum .	145	968	Rubber Goods .	—	600
Oil Seeds and Fruits .	10	678	Chemical Pro- ducts . .	—	539
Wool .	699	646	Metal Goods and Tools . .	—	489
Coffee .	225	498	Leather . .	67	463
Wine .	276	486	Wine . .	200	385
Cast-iron and Steel .	—	463	Paris Goods, &c.	191	271
Metal Goods .	—	461	Pottery and Glass . .	—	209
Chemical Pro- ducts .	139	388	Raw Silk and Yarn . .	162	184
Copper .	207	254	Table Fruits .	—	147
Woollen Text- ures .	—	98	Milk, Butter, and Cheese .	54 ¹	97

¹ Butter.

FRANCE—*Continued.*

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
Belgium	1,000,000 Francs.	1,000,000 Francs.	1,000,000 Francs.	1,000,000 Francs.
United Kingdom	556	1,789	1,108	3,250
United States	1,113	3,039	1,454	3,179
Germany	895	4,065	423	2,193
Switzerland	1,069	2,163	867	1,877
Italy	135	465	406	1,092
Spain	241	569	306	686
Argentine Republic	282	477	151	563
Brazil	369	596	200	271
	174	452	86	165

Currency.—The unit of the French coinage is the franc, worth normally about 9½d., and divided into 100 centimes. The gold and the silver coinage of Belgium, Italy, Switzerland, and Greece are based on the same units, and being of the same fineness, size, and weight, are generally accepted. The same monetary system has been adopted, either wholly or partially, in Spain, Romania, Bulgaria, Yugoslavia, Russia, Finland, and several South American states.

Weights and Measures.—The unit of length is the metre, 39·4 inches approximately. It is subdivided into tenths or decimetres, hundredths or centimetres, and thousandths or millimetres. A centimetre is $\frac{1}{10}$ and a millimetre $\frac{1}{100}$ of an inch. The unit of distance is the kilometre, measuring 1000 metres, or $\frac{1}{2}$ mile. The square kilometre is about $\frac{1}{2}$ of a square mile, and contains 100 hectares, each about $2\frac{1}{2}$ acres.

The unit of weight is the gram (gramme). 1000 grams, or about $2\frac{1}{4}$ lb. avoirdupois, make a kilogram. In ordinary retail trade most goods are sold by the demi-kilo of 500 grams, otherwise known as the livre or pound, and weighing $1\frac{1}{16}$ lb. avoirdupois. The metric ton, or tonne, consists of 1000 kilograms, or 2205 lb., against the English ton of 2240 lb. The measure of capacity is the litre, $1\frac{1}{4}$ pints.

* GERMANY.¹

PRINCIPAL CLASSES OF TRADE, 1913.

	Imports.	Exports.
Agricultural Products and Foodstuffs	1,000,000 Marks.	1,000,000 Marks.
Mineral Raw Materials	7,037	1,728
Textile Materials and Manufactures	1,087	870
Base Metals and Manufactures thereof	805	1,561
Chemical and Pharmaceutical Products	689	1,906
Leather and Leather Goods	430	956
Machinery and Electro-technical Goods	164	553
	140	1,144

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports. 1913.	Exports. 1913.
United Kingdom	1,000,000 Marks.	1,000,000 Marks.
Austria-Hungary	876	1,438
Russia-in-Europe827	1,105
France	1,425	880
United States	584	790
Netherlands	1,711	713
Belgium	333	693
Switzerland	345	551
Italy	213	536
	318	393

¹ Owing to the depreciation in and fluctuations of the Mark it is impossible to give any useful table of German post-war trade. The tables given show the principal classes of trade commodities in 1913, and the principal articles of trade with the United Kingdom in British currency for 1921.

GERMANY—*Continued.*

TRADE WITH UNITED KINGDOM.

Imports.	1921.	Exports.	1921.
Total	£1,000, 17,861	Total	£1,000. 20,514
Fish	1,965	Toys	1,372
Coal, Coke, &c. . .	965	Machinery	1,049
Cottons	952	Glass and Manufactures	
Alpaca, &c., Yarn . . .	655	Dyes	855
Woollens	354	Cottons	777
Machinery	318	Clover and Grass	117
Iron and Steel	129	Hops	110
Linseed Oil	126	Woollens	75
			52

Money, Weights, and Measures.—The monetary unit is the mark, of which 20·43 are normally equivalent to £1. Metric weights and measures are used.

*HUNGARY.

	Imports. 1921.	Exports. 1921.
Total	1,000,000 Korona, 43,024	1,000,000 Korona, 22,289
Vegetable Products	2,000	9,894
Manufactured Articles	35,986	8,302
Animal Products	539	1,460
Live Animals	513	1,337
Raw Materials for Industry and Agriculture	3,726	1,251
Mineral Products	260	45

Money.—In Hungary the unit is the Korona ; pre-war value = 10d.
Weights and Measures.—Metric.

*GREECE.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	1,000 Drachmai. 178,657	1,000 Drachmai. 1,725,605	Total . . .	1,000 Drachmai. 118,921	1,000 Drachmai. 947,728
Agricultural Products . .	47,522	511,879	Agricultural Products . .	59,131	683,094
Yarns and Textiles* . .	18,170	351,061	Oils . . .	8,824	69,468
Crude Metals and Ores . .	—	151,236	Yarns and Textiles . .	—	45,276
Medicinal and Chemical Products . .	8,414	105,878	Wines, Spirits, and Beverages	21,480	31,080
Confectionery Products, &c.	—	101,012	Animal Food Products . .	4,580	29,252
Metals and Ores and Manufactures thereof	5,866	75,967	Medicinal and Chemical Products . .	1,263	28,425
Hides, Skins, and Manufactures thereof	—	57,826			
Forest Products	13,401	55,438			
Fishery Products . .	10,529	48,117			
Animal Food Products . .	5,294	42,910			
Living Animals	12,782	37,511			

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom	1,000,000 Drachmai. 41	1,000,000 Drachmai. 294	1,000,000 Drachmai. 27	1,000,000 Drachmai. 201
United States	3	393	9	175
Germany	13	84	12	140
Egypt	1	55	8	67

Money.—Greece belongs to the Latin Monetary Union; a drachma is equivalent to a franc.

Weights and Measures.—The Metric System is replacing the old.

GUATEMALA.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . .	1,000 Dollars. 10,062	1,000 Dollars. 10,690	Total . .	1,000 Dollars. 14,450	1,000 Dollars. 12,131
Cottons . .	1,735	2,916	Coffee . .	12,255	9,221
Iron and Steel Goods . .	—	1,289	Bananas . .	826	1,197
Railway Ma- terial . .	—	1,230	Timber . .	248	526
Wheat Flour . .	—	661	Sugar . .	349	290
Machinery . .	—	537	Chicle ¹ . .	—	252

¹ The basis of chewing-gum.

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United States	1,000 Dollars. 5,053	1,000 Dollars. 6,532	1,000 Dollars. 3,923	1,000 Dollars. 8,108
United Kingdom	1,650	1,898	1,857	135

Money.—1 dollar or peso = 100 centavos = 4s.

Weights and Measures.—The Metric System is now adopted, but the old is still in use. 1 tonelada = 20 quintals = 18·10 cwt.

ITALY.

Imports.	1913.	1920.	Exports.	1913.	1920.
Total . .	1,000 Lire. 3,637,775	1,000 Lire. 15,862,136	Total . .	1,000 Lire. 2,503,925	1,000 Lire. 7,803,792
Wheat . .	406,206	5,084,088	Cotton Manufactures .	208,629	1,903,309
Cotton, raw .	324,665	2,816,479	Silk, raw .	339,026	1,787,883
Coal and Coke .	389,191	2,779,783	Silk Manufactures .	108,237	609,310
Wool and Woolen Goods .	83,022	1,756,100	Hemp, raw .	58,378	558,532
Wrought - iron and Steel .	—	1,159,495	Spun Cotton, Yarn, &c. .	36,047	363,871
Tobacco . .	40,504	840,214	Automobiles .	31,876	307,338
Boilers and Machinery .	76,133	729,940	Wines .	101,049	299,873
Petroleum and Benzine . .	17,307	498,119	Rubber and Gutta-percha .	—	298,598
Timber . .	129,088	416,885	Hats .	43,667	260,269
Hides (fresh or dried) . .	129,088	413,274	Sulphur .	36,777	120,164
Fish (dried or in oil) . .	49,624	405,576			

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1920.	1913.	1920.
France	1,000,000 Lire. 233	1,000,000 Lire. 1,903	1,000,000 Lire. 231	1,000,000 Lire. 1,696
Switzerland	87	574	249	1,504
United Kingdom	592	4,607	261	1,379
Balkan Lands	136	385	74	1,189
United States	523	8,688	268	936
Austria	—	651	—	621
Argentine Republic	167	3,005	186	604

Money.—Italy belongs to the Latin Monetary Union. The lira is equivalent to the franc. (See France.)

Weights and Measures.—Metric.

JAPANESE EMPIRE.

JAPAN.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	1,000 Yen. 729,432	1,000 Yen. 1,614,155	Total . . .	1,000 Yen. 632,460	1,000 Yen. 1,252,838
Cotton, raw . .	223,599	438,173	Silk, raw . .	188,925	417,124
Machinery . .	34,426	120,265	Cotton Tissues .	33,612	203,673
Iron, bar, rod, plates, &c. .	32,817	115,161	Silk Tissue .	34,882	89,936
Oilcake . .	39,499	94,311	Cotton Yarn .	70,998	80,568
Sugar . .	36,802	69,815	Coal . .	23,671	37,815
Wool . .	15,998	32,203	Earthenware .	6,639	20,792
Woollen Tissues	10,498	31,084	Matches . .	11,865	16,239
Rice . .	48,472	28,813	Sugar, refined .	15,831	15,799
Beans and Peas	10,393 ¹	24,691	Timber . .	—	15,341
Rubber, crude .	—	15,724	Machinery . .	—	12,883
Flax and Hemp .	—	14,660	Silk Waste and Floss Silk . .	10,471	10,367
Aniline Dyes .	—	13,465	Glassware . .	—	9,997

¹ Soya Beans.DISTRIBUTION OF TRADE WITH OTHER COUNTRIES
(JAPAN AND FORMOSA).

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United States . . .	1,000 Yen. 122,408	1,000 Yen. 574,401	1,000 Yen. 184,473	1,000 Yen. 496,284
China . . .	61,223	191,678	154,660	287,227
British India . . .	173,174	210,365	29,873	84,504
Hong Kong . . .	1,295	1,017	33,622	59,304
Dutch Indies . . .	37,389	70,427	5,149	54,211
United Kingdom . . .	122,737	184,307	32,870	32,772

JAPANESE EMPIRE—*Continued.*
KOREA

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . .	1,000 Yen. 71,580	1,000 Yen. 232,382	Total . .	1,000 Yen. 30,879	1,000 Yen. 218,277
Cotton Goods . .	2,227	44,865	Rice . .	14,494	92,813
Coal . .	1,811	8,767	Beans, Peas and Pulse . .	5,719	24,381
Timber . .	1,858	7,956	Cattle . .	212	3,583
Grass Cloth . .	1,397	5,527	Hides . .	1,268	2,720
Machinery . .	1,554	5,449	Gold Ore . .	9,973	2,499
Sugar . .	1,871	4,546			
Kerosene Oil . .	2,033	4,334			
Paper . .	1,351	4,542			

Money.—The monetary unit is the yen, equivalent to 2s. 0½d.

Weights and Measures.—The kin=160 mommē=1½ lb.; the kwan=8·27 lb.; the shaku=10 sun=11·9 inches; a ri=2·44 miles. The Metric System is also used in the following ratios: 1 metre=3·3 shaku; 1 gramme=0·266 mommē.

NICARAGUA.

	Imports.		Exports.		
	1913.	1921.	1913.	1921.	
Total	1,000 Dollars gold. 5,770	1,000 Cordobas. 5,310	1,000 Dollars gold. 7,711	1,000 Cordobas. 8,071	
United States . . .	3,244	3,857	2,722	6,265	
United Kingdom . . .	1,151	654	999	109	
Exports.	1913.	1921.	Exports.	1913.	1921.
Coffee . .	\$1,000 gold. 5,004	1,000 Cordobas. 2,352	Gold . .	\$1,000 gold. 704	1,000 Cordobas. 990
Bananas . .	430	1,405	Wood . .	319	902
Sugar . .	32	1,309	Silver . .	17	268

Money.—1 gold cordoba=American dollar.

Weights and Measures.—Metric.

MAROCCO.

Imports.	1913-14.	1921.	Exports.	1913-14.	1921.
Total . . .	£1,000. 11,133	1,000 Francs. 909,164	Total . . .	£1,000. 1,936	1,000 Francs. 306,447
Cottons . . .	1,373	146,015	Barley . . .	54	63,328
Sugar . . .	1,796	123,005	Beans . . .	12	32,351
Machinery, Hardware . . .	564	74,691	Eggs . . .	200	32,121
Wines, Spirits, Beer, &c. . .	627	31,901	Linseed . . .	22	19,958
Tea . . .	448	22,258	Cumin . . .	9	2,539
Woollen Goods	410	10,501	Gums . . .	23	1,430
Oils, Vegetable	131	6,979			
Candles . . .	200	5,277			
Soap, Unscented	59	4,081			

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913-14.	1921.	1913-14.	1921.
France and Algeria . . .	£1,000. 5,793	1,000 Francs. 451,943	£1,000 930	1,000 Francs. 90,902
United Kingdom and Gibraltar . . .	2,139	141,143	267	46,152

Money.—French, Moorish, and Spanish coins are current.

Weights and Measures.—1 kantar, used for the produce of the country, sold by weight=100 rotals=generally 168 lb. ; 1 kantar, used in selling imported articles=100 rotals=112 lb. ; 1 drach=8 tominis=about 22 inches. The Metric System is current in the French zone.

MEXICO.

Imports.	1912-13.	1920.	Exports.	1912-13.	1920.
Total . . .	£1,000. 19,577	1,000 Pesos. 357,550	Total . . .	£1,000. 30,041	1,000 Pesos. 406,547
Mineral Products . . .	4,745	83,779	Mineral Products . . .	18,965	279,504
Vegetable Products . . .	3,157	56,907	Vegetable Products . . .	8,594	105,295
Manufactured Goods . . .	8,799	51,031	Manufactured Goods . . .	335	15,165
Animal Products	1,804	38,982	Animal Products	1,984	6,584

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1912-13.	1920.	1912-13.	1920.
United States	£1,000. 9,729	1,000 Pesos. 339,413	£1,000. 23,204	1,000 Pesos. 595,986
United Kingdom	2,590	44,879	3,115	49,000
Argentine Republic	—	481	—	13,854
France	1,834	46,639	715	8,205

Money.—The standard gold peso or dollar = .75 gramme of pure gold ; 1 American dollar = 2 Mexican gold pesos.

Weights and Measures.—Metric. The old Spanish measures are occasionally employed.

NETHERLANDS.

Imports.	1913.	1921.	Exports.	1913.	1921.
	1,000 Guilder.	1,000 Guilder.		1,000 Guilder.	1,000 Guilder.
Total . .	3,918,000	2,240,219	Total . .	3,083,000	1,369,599
Cereals and Flour . .	657,283	256,929	Textile, raw and manufactured	199,846	124,700
Textile, raw and manufactured	228,516	217,695	Gold and Silver	18,494	101,965
Iron and Steel of all kinds . .	548,060	137,122	Cheese . .	23,074	67,706
Coal . .	139,954	126,770	Sugar . .	77,381	62,914
Wood . .	137,664	92,746	Margarine . .	66,699	58,324
Seeds (colza, linseed, &c.)	59,425	66,584	Butter . .	37,060	48,670
Mineral Oil . .	16,276	59,300	Coal . .	58,047	36,424
Manures . .	67,593	51,898	Paper . .	88,022	33,974
Gold and Silver	21,843	48,283	Iron and Steel of all kinds . .	328,744	32,354
Coffee . .	63,781	44,987	Cereals and Flour . .	437,505	31,761
Tobacco (unmanufactured)	16,019	38,062			
Paper . .	11,074	29,977			

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom	1,000,000 Guilder.	1,000,000 Guilder.	1,000,000 Guilder.	1,000,000 Guilder.
Germany	341	312	684	352
Dutch East Indies	1,059	628	1,363	254
Belgium	529	129	163	191
France	352	227	340	170
United States	33	65	31	85
	443	392	131	47

Money.—1 gulden, guilder, or florin = 100 cents = 1s. 8d., or 12 = £1.

Weights and Measures.—Metric.

NORWAY.

Imports.	1913	1921.	Exports.	1913.	1921.
Total . . .	1,000 Kroner. 590,894	1,000 Kroner. 1,463,550	Total . . .	1,000 Kroner. 431,073	1,000 Kroner. 637,966
Vessels, Carriages, Machinery, &c.)	84,806	404,904	Animal Produce (Malty Food).	132,038	150,172
Breadstuffs .	64,088	165,636	Timber and Wooden Goods	89,818	140,934
Tallow, Oils, Tar, &c. . .	40,949	117,368	Minerals, Manu- factured . . .	19,680	74,434
Animal Produce (Malty Food) .	16,311	103,278	Paper and Paper Manufactures .	32,248	65,959
Groceries . . .	39,055	100,532	Tallow, Oils, Tar, &c. . .	16,676	45,042
Minerals, Un- wrought . . .	59,934	98,532	Metals, Un- wrought or partly Wrought	17,886	38,057
Textile Manu- factures, &c. .	45,160	95,004	Vessels, Carriages, Machinery, &c.)	8,782	30,642
Metals, Manu- factured . . .	38,337	84,799	Hair, Skins, &c.	33,727	25,911
Fruits, Plants, &c	11,383	48,937	Minerals, Un- wrought . . .	21,190	20,950
Minerals, Manu- factured . . .	6,547	40,275	Metals, Manu- factured . . .	1,893	3,467

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom	1,000 Kroner. 146,200	1,000 Kroner. 378,693	1,000 Kroner. 104,797	1,000 Kroner. 175,077
America	51,021	352,980	62,854	97,623
Germany	176,305	271,048	89,815	84,057
Sweden	84,765	126,237	26,682	49,808

Money.—The Norwegian krone=1 Swedish krona=100 öre=1s. 1½d.
Weights and Measures.—Metric.

PERSIA.

Imports.	1912-13.	1921.	Exports.	1912-13.	1921.
	1,000 Krâns.	1,000 Krâns.		1,000 Krâns.	1,000 Krâns.
Total . . .	624,333	482,352	Total . . .	479,967	371,199
Sugar . . .	138,978	148,823	Petroleum Products . . .	—	233,857
Cotton Tissues .	186,190	115,974	Wool Carpets . . .	60,392	49,968
Tea . . .	40,978	25,282	Opium . . .	34,916	22,178
Rice . . .	5,302	13,058	Fruits . . .	47,457	14,655
Live Animals .	1,466	12,561	Gum Tragacanth .	13,902	6,940
Cotton Thread .	—	11,524	Tobacco, raw .	2,437	3,726
Iron and Steel Goods .	5,913	9,533	Cotton Tissues .	2,160	3,499
Pure Wool Tissues . . .	15,815	7,650	Sheep Skins .	—	3,369
Nails, Screws, Rivets and Piping .	—	7,214	Silk, raw .	1,792	2,894
Mercery and Smallwares .	10,100	6,766	Wool, raw .	11,300	2,573
Iron and Steel Bars and Plates .	—	6,406	Cotton, raw .	93,843	2,343
Machinery and Implements .	—	6,278	Pearls . . .	3,540	2,219
Matches . . .	3,166	6,450	Silk Tissues .	6,639	1,868
			Drugs . . .	3,638	1,636
			Asafoetida .	—	1,582
			Rice, Wheat, and Barley .	50,628	1,232

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1912-13.	1920-21.	1912-13.	1920-21.
British Empire (with India) . . .	1,000 Krâns.	1,000 Krâns.	1,000 Krâns.	1,000 Krâns.
Egypt	153,181	365,927	56,618	106,739
Mesopotamia	59	31,641	1,574	152,603
Russia	—	6,647	—	46,021
United States	328,980	20,103	300,878	8,615
	947	5,123	6,374	22,844

Money.—1 krân=1000 dinars, an imaginary coin, in which accounts are kept, formerly=1 franc, but now less than 4½d.

PERU.

Imports.	1913.	1920.	Exports.	1913.	1920.
Total . . .	1,000 £P. 6,089	1,000 £P. 18,358	Total . . .	1,000 £P. 9,138	1,000 £P. 35,304
Provisions, &c. .	—	4,149	Sugar . . .	1,413	15,585
Metals . . .	—	2,235	Cotton . . .	1,565	11,190
Machinery . . .	—	1,952	Copper . . .	1,683	3,625
Cottons . . .	—	1,497	Petroleum . . .	910	1,431
Woollens . . .	—	920	Wool . . .	650	855

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1920.	1913.	1920.
United States	1,000 £P. 1,906	1,000 £P. 10,169	1,000 £P. 2,952	1,000 £P. 16,265
United Kingdom	1,556	2,694	3,312	12,682
Chile	208	1,040	1,171	3,214
France	273	547	314	840

Money.—1 gold libra = 10 soles = £1.

Weights and Measures.—The Metric System is coming into general use. The old Spanish system is still common. 1 quintal = 101·44 lb.; 1 arroba = 25·4 lb. = 6·7 gallons; 1 vara = 0·93 yard.

*POLAND.

Until the year 1922 Polish statistics were given only by weight.

	Imports. 1921.	Exports. 1921.
Total	1,000 Tons. 4,745	1,000 Tons. 2,028
Raw Materials	3,736	1,471
Foodstuffs	618	163
Manufactures	378	378
Semi-manufactures	13	16
Estimated total value in millions of Polish Marks	440,668	90,575

POLAND—Continued.

TRADE WITH UNITED KINGDOM, 1921.

					£1,000.
Imports into Poland					3,002
Exports from Poland					1,840

Money.—Zloty=1 gold franc (not yet in circulation).

Weights and Measures.—Metric.

PORTUGAL.

(INCLUDING AZORES AND MADEIRA).

Imports.	1912.	1920.	Exports.	1912.	1920.
Total . . .	1,000 Escudos. 74,639	1,000 Escudos. 690,998	Total . . .	1,000 Escudos. 34,325	1,000 Escudos. 222,151
Coal . . .	5,125	70,154	Wine . . .	12,460	1
Cotton . . .	5,234	47,460	Manufactured		
Codfish . . .	4,513	40,620	Cork . . .	4,119	3,948
Rice . . .	1,719	12,623	Raw Wool . .	137	1,701
Fertilizers . .	—	7,364	Sardines . . .	3,021	1,664
Coffee . . .	—	2,560	Chemicals . .	—	1,088
Animal Fats . .	—	1,125	Raw Hides . .	275	816
Beans . . .	753	555	Olive Oil . .	687	646
Rubber . . .	—	218	Rosin . . .	—	458

¹ Wine exported to United Kingdom (1922) valued at £2,587,095.

TRADE WITH UNITED KINGDOM.
(British Board of Trade Returns.)

	Imports.	Exports.
	1920.	1920.
	£1,000.	£1,000.
United Kingdom	10,555	6,899

Money.—1 gold escudo = 1 gold milreis = 100 centavos = (normally) 4s. 5d.

Weights and Measures.—The Metric System is the legal standard. The old system is still in use.

*ROMANIA.

Imports.	1921.	Exports.	1921.
Total	1,000 Leि. 11,706,569	Total	1,000 Leि. 8,129,607
Vegetable Fibres and Manufactures . . .	3,524,623	Cereals and Cereal By-products . . .	4,139,266
Metals, Manufactures thereof, and Minerals .	1,964,587	Petroleum and Bitumen	1,850,918
Wool and Hair and Manufactures	952,848	Live Stock	659,190
Hides, Articles thereof	642,470	Timber and Manufactures	468,900
Sugar and Manufactures	600,588	Vegetables and Seeds	380,494
Machines	558,480	Alimentary Animal Products	245,581
Ready-made Clothes	408,168	Metals, Manufactures thereof, and Mineral Products	110,977
Vehicles	299,155	Colonial Fruits and Foodstuffs	96,542
Rubber, Gutta-percha, Vegetable Juices	275,943	Chemical Products and Drugs	31,452
Chemical Products and Drugs	273,470	Rubber, Gutta-percha, Vegetable Juices	24,677
Silk and Manufactures	250,194	Animal Waste and various Animal Substances	23,174
Colonial Fruits and Foodstuffs	225,737	Hides, Articles thereof	22,337
		Beverages	20,458
		Wool and Hair and Manufactures thereof	10,945
		Machines	10,672

Money.—1 leü=100 bani=1 franc. (See France.)

Weights and Measures.—Metric.

*RUSSIA.

Imports	1922.	Exports.	1922.
Total . . .	1,000 Gold Roubles. ¹ 262,211,000	Total . . .	1,000 Gold Roubles. ¹ 74,982,000
Foodstuffs . .	91,648,000	Timber . . .	14,500,000
Metals and Machinery .	78,380,000	Flax and Hemp . .	12,241,000
Coal . . .	13,150,000	Metal Ores . .	6,823,000
Timber Seed . .	3,969,000	Foodstuffs . .	3,438,000

¹ 1913 Prices.

TRADE WITH UNITED KINGDOM, 1921.

Imports.		Exports.	
Total . . .	£1,000. 2,181	Total . . .	£1,000. 2,695
Coal . . .	226	Sawn Timber . .	756
Cotton . . .	123	Fish. . .	687
Machinery . .	36	Hides and Skins .	211
Woollens. . .	10	Petroleum . .	83
Boots . . .	7	Flax . . .	78
		Tobacco . . .	59

Money.—The legal unit is the silver rouble=100 kopecks=(normally) 2s. 1'6d.; 1,000,000 roubles=£105,735, 7s. Officially 9·46 roubles=£1. 1 pood=40 lb.=36 lb. avoirdupois; 63 poods=1 ton; 1 chetvert=5·7 bushels= $\frac{7}{5}$ imperial quarter; 1 verst= $\frac{1}{4}$ statute mile; 1 sajene=3 arshins=7 feet; 1 dessiatine=2 $\frac{1}{2}$ acres.

SALVADOR.

	1913.	1920.	Exports.	1920
Imports .	1,000 Gold Dollars. 2,546	1,000 Gold Dollars. 12,628	Coffee . .	12,404
Exports .	3,880	17,944	Sugar . .	1,104
			Balsam . .	340
			Rice . .	295
			Henequen . .	255

SALVADOR—*Continued.*

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

		Imports, 1920.	Exports, 1920.
		1,000 Dollars gold.	1,000 Dollars gold.
United States		7,783	11,623
Norway		6	1,606
Sweden		15	1,443
France		482	1,057
United Kingdom		2,072	753

Money.—1 gold colon = about 2 dollars.

Weights and Measures.—Metric.

SIAM.

Imports.	1913-14.	1921-22.	Exports.	1913-14.	1921-22.
Total . .	£1000. 6,962	£1000. 13,959	Total . .	£1,000. 8,859	£1,000. 17,171
Cotton Goods .	1,351	2,643	Rice . .	7,304	14,429
Foodstuffs .	—	1,842	Teak. .	—	742
Metal Manufactures .	—	1,037			
Cotton Yarn .	—	607			
Tobacco, Cigarettes, &c. .	—	501			
				1913.	1921-22.
Imports to Siam from United Kingdom . .				£1,000. 1,352	£1,000. 2,236
Exports from Siam to United Kingdom . .				516	299

Money.—The unit is the silver tical = 1s. 6½d.; 13 ticals = £1.

Weights and Measures.—1 hap = 100 catties = 60·48 kilogrammes or 133½ lb.; 1 yote = 400 sen = 10 miles (approx.).

SPAIN.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
Total	1,000 Pesetas. 1,179,457	1,000 Pesetas. 1,261,390	1,000 Pesetas. 997,725	1,000 Pesetas. 812,440
Alimentary Substances, including Grain, Sugar, Wine, &c. . . .	250,567	359,363	424,943	421,140
Metals and their Manufactures	87,898	110,277	143,617	105,457
Stone, Minerals, Glassware, and Pottery	121,225	87,415	145,685	51,670
Drugs and Chemical Products	105,488	105,534	36,466	51,293
Timber and its Manufactures	63,870	44,216	66,242	39,909
Cotton and its Manufactures	131,480	133,686	46,651	38,619
Wool and Hair and their Manufactures	16,527	10,434	23,018	26,471
Animals and their Products	72,131	44,071	49,048	23,995
Paper and its Applications	15,973	20,581	14,172	12,238
Silver	2,619	496	19,512	10,411
Silk and its Manufactures	23,217	17,468	5,052	7,884

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1920.	1913.	1920.
France	1,000,000 Pesetas. 204	1,000,000 Pesetas. 219	1,000,000 Pesetas. 328	1,000,000 Pesetas. 280
United Kingdom	245	214	232	219
Cuba	2	17	65	81
United States	167	331	72	78
Morocco	4	12	9	20
Germany	185	86	74	16

Money.—1 peseta = 100 centesimos = 1 franc = 9½d. nominally, but about 9d. actually.

Weights and Measures.—Metric. The old system is still largely used. 1 quintal=220·4 lb. avoirdupois; 1 libra=1·014 lb. avoirdupois; 1 arroba of wine=3½ imperial gallons; 1 arroba of oil=2½ imperial gallons.

SWEDEN.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
Total	1,000 Kroner. 846,538	1,000 Kroner. 1,258,719	1,000 Kroner. 817,347	1,000 Kroner. 1,097,271
Wood Pulp, Paper and Paper Manufactures . .	7,948	13,213	142,784	287,725
Metal Goods, Machinery, &c.	92,113	243,752	92,509	218,310
Timber, Wrought and Unwrought	20,932	13,729	215,702	193,028
Live Animals and Animal Food	32,240	83,403	93,374	87,531
Minerals (of Imports mostly Coal)	148,807	140,956	94,142	71,328
Metals, Raw and partly Wrought	48,796	42,746	78,623	58,156
Corn and Flour	65,290	116,956	11,031	35,081
Textile Manufactures. .	62,062	107,579	5,692	20,178
Raw Textile Material and Yarn	81,821	72,190	5,002	6,486
Colonial Wares	60,086	97,870	686	1,877
Other Articles	181,798	269,080	54,819	91,947

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
United Kingdom	1,000 Kroner. 206,814	1,000 Kroner. 217,517	1,000 Kroner. 237,885	1,000 Kroner. 327,072
Germany	289,902	324,568	179,078	118,625
Norway	25,928	41,182	54,034	106,661
United States	76,583	242,892	34,403	97,346

Money.—1 krona = 100 öre = 1s. 1½d.

Weights and Measures.—Metric.

SWITZERLAND.

Imports.	1913.	1921.	Exports.	1913.	1921.
	1,000 Francs.	1,000 Francs.		1,000 Francs.	1,000 Francs.
Total . . .	1,919,816	2,296,288	Total . . .	1,376,399	2,140,141
Cereals . . .	232,350	323,610	Cotton Goods	260,936	357,433
Cotton Goods .	131,845	187,742	Silk Goods .	271,276	341,008
Mineral Substances .	125,037	187,140	Machinery .	98,725	232,647
Animal Food Substances .	98,564	183,220	Clocks . . .	183,049	157,958
Colonial produce . . .	102,889	180,085	Animal Food Substances	121,349	77,712
Silk Goods . . .	191,922	139,335	Colonial Produce . . .	58,540	58,004
Beverages . . .	60,414	105,160	Hides and Skins . . .	47,271	50,117
Iron Work . . .	103,265	96,123	Clothing, Ready Made	22,766	44,669
Woollen Goods .	74,395	83,040	Woollen Goods	23,994	39,186
Chemicals . . .	47,741	64,782	Mineral Substances . . .	14,964	31,082
Fruits and Vegetables . . .	49,688	60,580	Iron Work . . .	32,802	30,614
Clothing, Ready Made . . .	56,707	60,334	Chemicals . . .	20,040	18,750
Machinery . . .	49,664	57,423	Timber . . .	8,368	16,268
Animals, Living . . .	60,406	39,863	Copper Work	10,393	11,785
Hides and Skins . . .	56,284	31,923			

SWITZERLAND—*Continued.*

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1913.	1921.
	1,000,000 Francs.	1,000,000 Francs.	1,000,000 Francs.	1,000,000 Francs.
United States	118	385	136	586
Germany	631	440	306	195
France	348	321	141	239
United Kingdom	113	156	236	349
Italy	207	200	89	74
Austria	—	32	—	88

Money.—1 franc=10 batzen=100 rappen or centimes; 25·2 francs=£1.

Weights and Measures.—1 centner=50 kilos.=100 pfund=110 lb.; 1 arpent= $\frac{1}{4}$ acre.

TUNIS.

Imports.	1913.	1920.	Exports.	1913.	1920.
Total . .	£1,000. 5,770	£1,000. 25,423	Total . .	£1,000. 7,147	£1,000. 13,482
Textiles .	570	5,589	Marble, Stone, Minerals .	1,985	5,106
Manufactured Metals . .	1,032	3,255	Crude Metals .	922	1,907
Mealy Foods .	511	2,332	Grain, Mealy Food .	1,166	1,457
Marble, Stone, and Minerals	76	1,782	Beverages and Wines . .	167	816
Colonial Produce	—	1,361	Hides . .	138	569
Timber . .	182	774	Textiles . .	125	542
Hides . .	121	652	Fruits and Seeds	52 ¹	489
Yarns . .	59	651	Live Animals .	361	348

¹ Dates.

TUNIS—*Continued.*

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1920.	1913.	1920.
Total	£1,000, 5,770	£1,000. 25,423	£1,000. 7,147	£1,000. 13,482
France	3,049	11,863	2,924	7,069
Italy	365	2,107	1,033	1,833
United Kingdom	576	2,769	624	1,664
Algeria	563	1,287	332	1,017

Money.—Legal coinage similar to that of France.

Weights and Measures.—The French weights and measures have almost entirely replaced those of Tunis; corn is still sold in kaffis, each of which = 16 bushels. The pik arbi, used in measuring linen, = 0·54 yard; the pik turki, for silk, = 0·7 yard; the pik andoulsi, for cloth, = 0·7 yard.

*TURKEY.

TRADE WITH UNITED KINGDOM.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . . .	£1,000. 7,762	£1,000. 4,719	Total . . .	£1,000. 5,441	£1,000. 1,064
Cottons . . .	4,598	2,469	Carpets . . .	214	184
Woollens . . .	425	505	Wool and Mohair	915	149
Coal . . .	339	290	Hides and Skins	—	63
Cotton Yarn . .	440	248	Opium . . .	309	20
Iron and Steel .	310	147	Tobacco . . .	—	15
Machinery . .	323	60	Dried Fruit . .	—	0·5

TURKEY—*Continued.*

TOTAL TRADE OF TURKEY WITH ALL COUNTRIES.

		1913-14.	1921.
Imports	:	£T1,000. 40,810	£T1,000. 121,330
Exports	:	21,436	30,380

Money.—£T1 or gold medjidié=100 piastres=18s.; £T10=£9.

Weights and Measures.—Metric is the legal standard, although not enforced. 1 cantar or kintal=44 okes=125 lb. avoirdupois; 1 kile=20 okes=0·36 imperial quarter; 1 endazé (cloth measure)=27 inches; 1 arshin (land measure)=30 inches.

UNITED STATES.

Imports.	1913-14.	1921-22.
Total	1,000 Dollars. 1,893,926	1,000 Dollars. 2,608,009
Silk, Unmanufactured	100,930	307,293
Sugar and Molasses	101,649	202,789
Coffee	110,725	148,503
Oils	47,021	146,769
Wood and Manufactures of	62,433	127,738
Chemicals, Drugs, Dyes, and Medicines	94,520	97,481
Fruits, including Nuts	53,421	89,865
Wool and Manufactures of	34,294	88,982
Rubber, Gutta-percha, and Substitutes	74,099	88,839
Cotton, Manufactured	70,705	88,196
Fibres, Vegetable and Textile Grasses, Manufactures of	82,404	87,229
Paper and Manufactures of	27,564	85,121
Hides and Skins	120,290	78,899
Tobacco and Manufactures of	40,387	63,249
Furs and Manufactures of	14,493	52,960
Precious and Semi-Precious Stones and Imitations of	33,963	47,232
Copper and Manufactures of	40,809	45,018
Cotton, Unmanufactured	19,457	43,958
Silk, Manufactures of	39,537	40,338
Seeds	20,084	39,896
Meat and Dairy Products	38,761	32,443
Iron and Steel, and Manufactures of	31,791	29,661

UNITED STATES—*Continued.*

Exports.	1913-14.	1921-22.
Total	1,000 Dollars. 2,329,684	1,000 Dollars. 3,771,182
Cotton, unmanufactured	610,475	596,379
Grains and Preparations of	165,302	591,295
Refined Mineral Oils	152,174	304,228
Machinery	31,966 ¹	245,977
Iron and Steel and Manufactures of	251,481	181,798
Tobacco, unmanufactured	61,453 ²	157,269
Meats	146,228	131,953
Animal and Fish Oils, Fats, and Greases	7,442	124,583
Cotton, Manufactures of	51,467	122,938
Copper and Manufactures of	149,480	101,152
Coal	59,921	100,116
Vehicles	51,676	99,748
Wood and Manufactures of	103,180	89,114
Sugar	3,507	77,447
Fruits and Nuts	31,850	66,628
Chemicals	27,079	50,260
Leather	57,566	41,245
Dairy Products	³	36,375
Rubber and Manufactures of	12,441	31,024
Fodders	21,668	25,129

¹ Agricultural Implements. ² Tobacco and Manufactures. ³ Included in 'Meats,' above.

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1912-13.	1920-21.	1912-13.	1920-21.
United Kingdom	1,000 Dollars. 295,565	1,000 Dollars. 327,786	1,000 Dollars. 597,150	1,000 Dollars. 1,326,388
Canada	121,723	529,422	420,149	788,980
Cuba	131,270	420,400	75,316	403,721
France	136,878	149,786	146,100	432,600
Germany	188,963	90,773	331,684	381,869
Japan	91,633	253,218	57,742	189,182
Mexico	77,544	154,994	54,572	267,170
Italy	54,107	59,097	76,285	302,121
Argentina	28,864	124,299	52,895	200,891
Netherlands	38,181	61,315	125,910	250,818

Money.—1 dollar = 100 cents = (par value) 49·32d.

Weights and Measures.—As British, except 1 cental = 100 lb.; 1 short ton = 2000 lb.; 1 long ton = 1 British ton (2240 lb.). Old Winchester gallon used; 1 bushel = 0·97 imperial bushel.

URUGUAY.

Imports.	1913.	1921.	Exports.	1913.	1921.
Total . .	1,000 Gold Pesos. 49,444	1,000 Gold Pesos. 40,351	Total . .	1,000 Gold Pesos. 63,544	1,000 Gold Pesos. 70,265
Foodstuffs . .	—	9,289	Wool . .	21,901	31,724
Fuel . .	—	7,112	Meat and Ex- tracts . .	6,898	21,120
Hardware . .	—	3,428	Hides . .	7,371	11,367
			Agricultural Produce . .	1,379	2,035
			Live Animals .	1,284	778

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1913.	1921.	1918.	1921.
United States . . .	1,000,000 Gold Pesos. —	1,000,000 Gold Pesos. 10	1,000,000 Gold Pesos. 2	1,000,000 Gold Pesos. 19
United Kingdom . . .	—	7	5	17
Germany . . .	—	3	9	11
France . . .	—	2	9	7
Argentine Republic . . .	—	5	8	3

Money.—1 peso oro not in circulation. £1 = 4·7 pesos.

Weights and Measures.—Metric.

VENEZUELA

Total Trade.	1912-13.	1920-21.	Exports.	1912-13.	1920-21.
Imports . .	1,000 Bolivars. 106,575	1,000 Bolivars. 190,892	Coffee . .	1,000 Bolivars. 78,702	1,000 Bolivars. 45,357
Exports . .	130,886	118,901	Cacao . .	12,010	17,857

Balata and
Rubber . .

Hides . .	12,344	7,320
Cattle . .	10,668	5,106
Gold . .	1,067	4,475
	6,131	2,369

DISTRIBUTION OF TRADE WITH OTHER COUNTRIES.

	Imports.		Exports.	
	1912-13.	1920-21.	1912-13.	1920-21.
United States	1,000 Bolivars. 35,403	1,000 Bolivars. 90,169	1,000 Bolivars. 51,367	1,000 Bolivars. 49,685
Netherlands	8,658	8,898	3,691	24,551
United Kingdom	22,971	37,124	8,478	13,461
Spain	4,800	12,023	7,587	10,521

Money.—1 bolivar=100 centimos; corresponds to franc. £1=25·25 bolivars.

Weights and Measures.—Metric.

YUGOSLAVIA (SERB, CROAT, AND SLOVENE STATE).

Imports.	1921.	Exports.	1921.
Total	1,000 Dinars. 4,122,098	Total	1,000 Dinars. 2,460,738
Metals and Machinery	474,400	Cattle and Other	
Agricultural Products	287,451	Animals	534,850
Chemicals	175,026	Maize	325,924
Animal Products	71,648	Corn	212,067
		Timber	170,920
		Prunes	144,285
			1921.
Imports from Yugoslavia into United Kingdom			£1,000.
Exports to Yugoslavia from United Kingdom			765
			1,048

Money.—1 Serbian dinar=1 franc. (See France.)

Weights and Measures.—Metric.

AREA, POPULATION (ACCORDING TO LATEST CENSUS OR
RECENT ESTIMATES), AND RAILWAY MILEAGE OF
THE PRINCIPAL COUNTRIES OF THE WORLD.

I.—BRITISH EMPIRE.

	Area.	Population.		Railway Mileage Open.
		Total Thousands.	Per Sq. Mile.	
UNITED KINGDOM . . .	1,000 Sq. Miles.	121·6	47,308	388·9
AFRICA—				
Cape of Good Hope . . .	277·0	2,783	10·0	4,254
Natal . . .	35·3	1,429	40·5	1,319
Orange Free State . . .	50·4	629	12·5	1,342
Transvaal . . .	110·5	2,088	18·9	2,644
South-west Africa . . .	322·4	227	0·7	1,163
Swaziland . . .	6·7	134	20·0	—
Basutoland . . .	11·7	499	42·6	—
Bechuanaland Protectorate .	275·0	153	0·6	2,468
Rhodesia . . .	440·0	1,736	3·9	
Nyasaland Protectorate .	39·6	1,202	30·4	174
Tanganyika Territory . .	365·0	4,122	11·3	1,000
Kenya Colony & Protectorate	200·0	2,376	11·9	618
Uganda Protectorate . .	110·3	3,066	27·8	70
Somaliland Protectorate .	68·0	300	4·4	—
Nigeria Colony & Protectorate	336·7	18,500	54·9	1,126
Gold Coast . . .	80·0	2,078	26·0	193
Sierra Leone Colony & Prot.	31·0	1,541	49·7	337
Gambia . . .	4·1	209	50·6	—
AMERICA—				
Canada . . .	3,603·3	8,788	2·4	39,771
Newfoundland . . .	42·7	259	6·1	951
West India Islands . . .	12·2	1,724	141·2	351
British Guiana . . .	89·5	307	3·4	98
British Honduras . . .	8·6	45	5·3	25
ASIA—				
India, British . . .	1,093·1	247,000	250·7	37,265
India, Native States . . .	709·6	71,939	101·4	
Ceylon . . .	25·3	4,505	177·8	731
Straits Settlements . . .	1·6	882	551·2	1,022
Federated Malay States .	27·5	1,325	48·2	
AUSTRALASIA—				
Commonwealth of Australia .	2,974·6	5,437	1·8	23,497
New Zealand . . .	103·6	1,219	11·8	3,156

II.—NON-BRITISH LANDS.

	Area.	Population.		Railway Mileage Open.
	1,000 Sq. Miles.	Total Thousands.	Per Sq. Mile.	
AFRICA—				
Algeria	222·2	5,802	26·1	2,221
Tunis	50·0	2,095	41·9	1,260
French Equatorial Africa . . .	782·0	2,846	2·9	—
French West Africa . . .	1,800·6	12,284	6·8	1,658
Marocco	231·5	6,000	25·9	914
Belgian Congo	909·7	8,508	9·4	2,663
Portuguese West Africa . . .	484·8	4,119	8·5	818
Egypt	12·2	12,751	1,042·9	3,040
AMERICA, NORTH—				
Mexico	767·2	13,887	18·1	10,754
United States	2,973·8	105,711	35·5	254,845
AMERICA, CENTRAL—				
Guatemala	48·3	2,005	41·5	652 ¹
Honduras	44·3	662	15·0	556
Nicaragua	51·7	638	12·4	146
Panama	32·4	434	13·4	47
Salvador	13·2	1,526	115·8	253 ¹
AMERICA, SOUTH—				
Argentine Republic	1,153·1	8,699	7·5	21,935
Bolivia	514·2	2,890	3·4	1,401
Brazil	3,275·5	30,636	9·3	17,213
Chile	289·8	3,755	12·9	5,403
Colombia	440·8	5,855	13·3	891
Ecuador	171·3	1,329	7·9	413
Paraguay	175·7	1,000	5·7	334
Peru	722·5	4,635	6·6	1,984
Uruguay	72·2	1,495	20·7	1,625
Venezuela	398·6	2,412	6·0	644
ASIA—				
Chinese Republic	4,277·2	318,653	74·5	8,675
Indo-China, French	256·9	19,747	76·9	1,265
Japan	148·8	55,963	376·2	6,728
Java and Madura	50·7	34,984	689·4	1,690
Persia	628·0	9,000	14·3	98
Russian Soviet Union	8,166·1	131,546	16·1	42,504 ²
Siam	194·6	8,266	42·5	1,376
Turkey ³	199·3	10,187	52·0	2,865

¹ Part included in the International Railway of Central America (incorporated 1912).² Including European Russia.³ Figures for Turkey partly estimates.

NON-BRITISH LANDS—*Continued.*

	Area.	Population.		Railway Mileage Open.
		Total Thousands.	Per Sq. Mile.	
EUROPE—		1,000 Sq. Miles.		
Austria	32·4	6,428	198·7	4,274
Belgium	11·8	7,462	635·0	4,649
Bulgaria	39·8	4,910	123·2	1,582
Czechoslovakia	54·2	13,610	250·9	8,718
Denmark	17·1	3,289	191·9	2,662
Finland	132·5	3,367	25·4	2,685
France	212·7	39,210	184·4	25,766
Germany	182·3	59,858	328·4	35,677
Greece	58·9	5,536	94·1	1,470
Hungary	35·8	7,946	222·0	4,493
Italy	118·0	38,836	329·1	10,290
Netherlands (Holland)	12·6	6,865	545·6	2,377
Norway	125·0	2,650	21·2	2,141
Poland	146·8	27,092	184·5	9,849
Portugal	34·3	5,629	164·3	2,128
Romania	122·3	17,393	142·2	7,246
Russia	1,488·2	93,388	62·7	42,504 ¹
Spain	194·8	21,347	109·5	9,504
Sweden	173·0	5,904	34·1	9,417
Switzerland	16·0	3,880	243·0	3,881
Turkey	? 10·9	? 1,891	? 173·0	? 350
Yugoslavia	96·1	12,017	125·0	5,696

¹ Including Asiatic Russia.

TRAFFIC THROUGH SUEZ AND PANAMA CANALS.

	SUEZ CANAL.		PANAMA CANAL.	
	No. of Vessels.	Net Tonnage 1,000 tons.	No. of Vessels.	Net Tonnage. 1,000 tons.
1913	5,085	20,034	—	—
1914	4,802	19,409	—	—
1915	3,708	15,266	1,072	3,772
1916	3,110	12,325	760	2,385
1917	2,353	8,369	1,806	5,818
1918	2,522	9,252	2,086	6,584
1919	3,986	16,014	2,028	6,145
1920	4,009	17,575	2,478	8,546
1921	3,975	18,119	2,892	11,416
1922	4,345	20,743	2,736	11,417

PRINCIPAL MERCANTILE MARINE COUNTRIES OF THE WORLD.¹

COUNTRIES.	Steam and Motor Vessels.				Sailing Vessels.				Total Tonnage.	
	Number.		Gross Tonnage.		Number.		Gross Tonnage. ²			
	1913.	1924.	1913.	1924.	1913.	1924.	1913.	1924.	1913.	1924.
United Kingdom .	8,524	8,299	1,000 Tons.	1,000 Tons.	755	395	483	166	1,000 Tons.	1,000 Tons.
Rest of Brit. Empire.	1,490	1,865	17,731	19,115	675	576	189	197	18,214	19,281
United States .	1,836	4,307	4,108	15,685	1,606	1,100	1,150	1,260	1,661	2,777
France .	932	1,659	1,638	3,453	559	362	414	284	5,258	16,945
Japan .	960	2,003	1,345	3,604	Not re corded.		280	153	1,345	8,004
Italy .	636	1,043	1,119	2,881	554	372	99	63	1,399	3,034
Holland .	602	1,051	1,104	2,007	170	16	26	19	1,130	2,626
Germany .	1,908	1,745	4,276	2,510	305	98	353	80	4,029	2,590
Norway .	1,495	1,669	1,695	2,370	637	131	598	176	2,293	2,552
Spain .	526	779	756	1,199	64	170	16	61	772	1,260
Sweden .	1,006	1,104	867	1,136	403	221	103	72	970	1,208
Denmark .	548	614	704	938	281	166	54	59	753	997
Greece .	346	391	649	747	87	14	19	8	668	756
Belgium .	152	264	267	605	8	6	5	12	272	617
Brazil .	370	337	291	460	64	45	14	19	305	479
Portugal .	105	164	86	261	100	120	27	41	112	302
Total (World) .	23,217	29,246	40,518	62,335	7,000	4,261	4,083	2,831	44,601	65,166
COUNTRIES.	Steel and Iron Vessels.				Wood and Composite Vessels.				Total Tonnage. ³	
	Number.		Tonnage. ³		Number.		Tonnage. ³			
	1913.	1924.	1913.	1924.	1913.	1924.	1913.	1924.	1913.	1924.
United Kingdom .	8,836	8,398	18,143	19,221	443	296	71	60	1,000 Tons.	1,000 Tons.
Rest of Brit. Empire.	1,176	1,522	1,418	2,500	989	919	243	277	1,661	2,777
United States .	1,501	3,659	4,117	15,000	1,941	1,757	1,141	1,945	5,258	16,945
France .	1,092	1,622	1,978	3,478	399	199	74	259	2,052	8,787
Japan .	660	1,309	1,269	3,402	300	684	76	202	1,845	3,604
Italy .	685	974	1,291	2,857	405	441	108	177	1,399	8,034
Holland .	679	1,095	1,125	2,619	22	19	5	7	1,130	2,626
Germany .	2,182	1,808	4,615	2,570	81	35	14	20	4,629	2,590
Norway .	1,771	1,525	2,148	2,401	381	275	145	91	2,293	2,552
Spain .	525	683	768	1,194	65	266	14	66	772	1,260
Sweden .	901	988	854	1,122	508	397	116	86	970	1,208
Denmark .	565	588	712	945	264	192	46	51	758	997
Greece .	841	378	648	747	92	27	20	8	668	765
Belgium .	167	264	271	612	3	6	1	5	272	617
Brazil .	366	844	291	407	68	38	14	12	805	479
Portugal .	110	154	90	262	95	130	22	40	112	302
Total (World) .	28,478	27,169	42,245	61,631	6,838	6,838	2,856	3,485	44,601	65,166

¹ Figures from Lloyd's Register of Shipping.² Net tonnage for 1913.³ Gross tonnage, except for sailing vessels, 1913, which are net tonnage.

COTTON PRODUCTION AND MANUFACTURE.
CHIEF SOURCES OF SUPPLY.

	Estimated Annual Production.	
	1906-10.	1920-21.
World's Total	Thousand Bales of 500 lb. each. 20,342	Thousand Bales of 500 lb. each. 19,252
United States	12,176	13,301
British India	3,509	2,485
Egypt	1,264	1,231
China	418 (1906)	1,000
Mexico	173	205
Russia	1,176	180
Peru	101	150
Brazil	296	100

CONSUMPTION OF RAW COTTON AND THE NUMBER OF SPINNING-SPINDLES IN USE.

	Consumption.		Spinning-Spindles in Work.	
	1912.	1923.	1912.	1923.
World's Total . .	Thousand Bales. 19,831	Thousand Bales. 20,884	Millions. 126·7	Millions. 156·8
Great Britain . .	3,765	2,595	48·7	56·6
United States . .	5,368	6,622	30·3	37·4
Germany . .	1,770	1,002	10·5	9·6
France . .	987	1,036	7·1	9·6
India . .	1,806	1,908	4·4	7·3
Japan . .	1,341	2,512	2·0	4·9
Italy . .	812	858	3·6	4·6
Czechoslovakia . .	—	239	—	3·5
China . .	—	1,428	—	2·7
Spain . .	323	351	1·9	1·8
Brazil . .	—	555	—	1·7
Belgium . .	234	271	1·3	1·7
Switzerland . .	90	95	1·2	1·5
Canada . .	—	140	—	1·1
Austria . .	864	101	4·7	1·0
Russia . .	2,035	508	7·7	0·9

SUGAR PRODUCTION IN 1920-21.

Cane Sugar.	Thousands of Centals (100 lb.).	Beet Sugar.	Thousands of Centals (100 lb.).
Cuba . . .	88,133	United States . .	24,775
British India . . .	56,515	Germany . .	24,071
Philippines . . .	12,170	Czechoslovakia . .	15,812
Brazil . . .	11,599	France . . .	7,028
Hawaii . . .	10,432	Spain . . .	6,427
Porto Rico . . .	9,797	Netherlands . .	6,359
Mauritius . . .	5,708	Belgium . . .	5,288
Formosa . . .	5,316	Poland . . .	3,968
Argentina . . .	4,622	Sweden . . .	3,620
Queensland . . .	3,651	Denmark . . .	3,367
Louisiana (U.S.A.) .	3,383	Italy . . .	2,742
Union of South Africa	3,181	Canada . . .	1,015

WHEAT PRODUCTION IN 1921.

	Production.	Yield per Acre.
	Million Bushels.	Bushels.
BRITISH EMPIRE—		
Canada	300·9	13·0
India	250·5	9·7
Australia	136·2	14·5
Great Britain and Ireland	73·8	36·2
New Zealand	10·5	29·0
FOREIGN COUNTRIES—		
United States	794·9	12·7
France	322·8	24·5
Czechoslovakia	197·9	26·4
Italy	192·8	16·4
Argentina	154·9	11·1
Spain	145·2	14·0
Germany	107·8	30·3
Romania	97·2	15·8
Hungary	47·0	17·5

APPENDIX.

WATER POWER.¹

	Developed Horse-Power.		Available Horse- Power (Minimum).
	1,000 Horse- Power.	Per 1,000 of Population.	1,000 Horse- Power.
United States	9,824	93	28,000
Brazil	320	10	26,000
Canada	2,974	338	18,255
Norway	1,654	624	5,500
Spain	440	21	5,000
France	2,100	54	4,700
Sweden	1,560	264	4,500
New Zealand	56	44	3,822
Italy	1,650	43	3,800
Japan	1,500	27	3,750
Finland	150	44	3,000
Switzerland	531	137	2,000
Germany	1,000	17	1,425
Great Britain	200	5	900

¹ Chiefly for 1922. Based on *Canada Year Book*.

PRODUCTION OF COAL.

	1913.	1922.
		Million Metric Tons.
World's Total	1,342·3	1,044·5
United States	517·1	420·6
United Kingdom	292·0	255·9
Germany	191·5	141·1
France	40·8	31·1
Japan	21·4	26·0
Poland	—	23·8
China	13·8	21·3
Belgium	22·8	21·2
India	16·5	19·0
Australia	12·6	14·5 ¹
Canada	13·6	13·6
Russia	33·8	10·6
Czechoslovakia	—	9·9

¹ Includes New Zealand.

PRODUCTION OF IRON AND STEEL.

	Pig Iron.		Steel Ingots and Castings.	
	1913.	1923.	1913.	1923.
World . .	Million English Tons.	Million English Tons.	Million English Tons.	Million English Tons.
United States .	77·2	64·6	75·0	72·6
Great Britain .	30·7	39·5	31·3	44·4
Germany . .	10·3	7·4	7·7	8·5
France . .	19·0	4·0	18·6	5·0
Belgium . .	5·1	5·0	4·6	4·8
Luxemburg . .	2·4	2·1	2·4	2·2
Poland . .	—	1·4	—	1·1
Czechoslovakia . .	—	0·5	—	0·9
Japan . .	—	0·6	—	0·7
	0·1	0·3	0·0	0·5

PRODUCTION OF PETROLEUM.

	Percentage of Total Output.	
	1912.	1922.
United States	62·8	64·7
Mexico	6·4	21·7
Russia	18·0	4·1
Persia	—	2·5
Dutch East Indies	2·7	1·9
Romania	3·6	1·2
India	2·1	0·9

PRODUCTION OF GOLD.

	1913.	1921.
	Thousand Fine Ounces.	Thousand Fine Ounces.
World's Total	22,250	15,960
Transvaal	8,798	8,129
United States	4,272	2,422
Canada	803	926
Australia	2,207	758
Mexico	934	684
Southern Rhodesia	690	586
British India	596	470

PRODUCTION OF WOOL.

	1923.		1923.
	1,000,000 lb.		1,000,000 lb.
World	2,180·6	British South Africa	185·0
Australia and Tasmania	490·0	New Zealand	180·0
Argentine Republic	270·0	United Kingdom	102·3
United States	266·1	Uruguay	96·3
		Spain	88·0

PRODUCTION OF RUBBER.

	1913.	1922.
	Tons.	Tons.
World's Total	108,440	380,280
From Plantations	47,618	355,340
" Brazil	39,370	21,735
" Other Sources	21,452	3,205

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